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L. F. L.
3924 Meade St.
DENVER, COLORADO

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L. F. BLANKENSHIP
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DENVER, COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 331

	Emerson Models 1176, 1177, 1178, 1179, 1180, 1181, 1186, 1187, 1188 and 1189 (Ch. 120292-P, -V, 120293-T, -X, 120299-V, 120300-X) were covered in Photofact Folder 7 - Set 331. Models 1190, 1192 (Ch. 120303-V) and 1194 (Ch. 120302-V) are added, along with late production changes, with the publication of this bulletin.
Ch. 120292-P	TUNER IDENTIFICATION Tuner part #470869 is used in Ch. 120292-P. A schematic of this tuner is given in Fig. 1.
Ch. 120302-V, 120303-V	Tuner part #470906 and 470905 are electrically identical to tuner part #470868 and 470889, except for the tuner shaft length and the addition of a crystal across the plate circuit of the oscillator tube.
Ch. 120293-T	Tuner part #470870 is used in Ch. 120293-T. A schematic of this tuner is given in Fig. 2.
Ch. 120293-X, 120300-X	Tuner part #470876 and 470892 are electrically identical except for tuner shaft length. A schematic of the tuners is given in Fig. 3. Complete alignment procedure for tuners #470876 and #470892 are given in this bulletin.
Ch. 120292-P, -V, 120293-T, -X, 120299-V, 120300-X, 120302-V, 120303-V	COMPONENT CHANGE T5, audio output transformer, part number is changed from 734123 to 734130.
	TO ELIMINATE CHANNEL 6 REGENERATION WITH BUILT-IN ANTENNA R35 is increased from 1000Ω to 4700Ω. C35 is increased from 15MMF to 22MMF. Chassis incorporating this change are coded as follows: 120292-P (A) 120299-V Initial Production 120292-V (A) 120300-X Initial Production 120293-T (A)
	TO IMPROVE BUILT-IN ANTENNA The built-in antenna is changed from hook-up wire to 300Ω twin lead. Chassis incorporating this change are coded as follows : 120292-P (B) 120299-V Initial Production 120292-V (B) 120300-X Initial Production 120293-T (B)
	TO IMPROVE IF ALIGNMENT R33 is increased from 5600Ω to 8200Ω. Chassis incorporating this change are coded as follows: 120292-P (C) 120299-V Initial Production 120292-V (C) 120300-X Initial Production 120293-T (C)

EMERSON MODELS 1176, 1177, 1178, 1179, 1180, 1181, 1186, 1187, 1188, 1189, 1190, 1192, 1194 (Ch. 120292-P, -V, 120293-T, -X, 120299-V, 120300-X, 120302-V, 120303-V)

PRODUCTION CHANGES
BULLETIN 175

PRODUCTION CHANGES
BULLETIN 175

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VHF OSCILLATOR ALIGNMENT

Connect negative lead of 3 volt bias supply to the AGC lug on the tuner. Connect positive lead to chassis.
To adjust the oscillator slugs on channels 4, 8 and 11 it will be necessary to remove the UHF tuner.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (A). Low side to chassis.	A28	Adjust so that sound marker falls in trap notch as in Fig. 7. The picture carrier marker should fall at about 30 to 40%.
2.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A29	Adjust so that sound marker falls in trap notch as in Fig. 7. The picture carrier marker should fall at about 30 to 40%. UHF section must be removed to make this adjustment.
3.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A30	"
4.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A31	"
5.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A32	"

VHF RF AND MIXER ALIGNMENT

Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (D). Low side to chassis.	A33,A34 A35,A36 A37,A38	Adjust A33, A34, A35, A36 and A37 for maximum response of curve similar to Fig. 8, with markers as indicated. A38 should be adjusted only if interference is encountered. If a nearby transmitter causes interference on channel 2, adjust A38 to eliminate it.
7.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to Fig. 8. If markers fall below 70% on any channel, make compromise adjustments of A33, A34, A35 A36 and A37 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
8.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A39, A40, A41, A42, A43	Adjust for response curve of maximum amplitude and symmetry as in Fig. 8 with markers above 90%.
9.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A44, A45, A46	"
10.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A47, A48, A49	"
11.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A50, A51, A52	"
12.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A58, A54	"

UHF IF ALIGNMENT

Connect the bias as under "VHF Oscillator Alignment".
Remove the 1N82A crystal from the crystal clip terminal.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizonal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Direct	High side to point (E). Low side to UHF tuner case.	44MC (10MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 10K to point (D). Low side to chassis.	A55, A56, A57	Adjust for maximum gain and symmetry as in Fig. 9. Remove test equipment and replace crystal in crystal clip.

UHF ALIGNMENT

The UHF portion of this tuner has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be necessary.

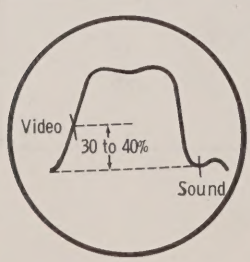

FIG. 7

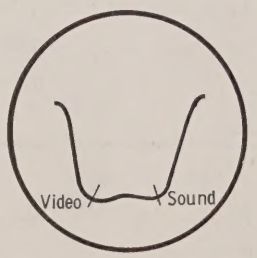

FIG. 8

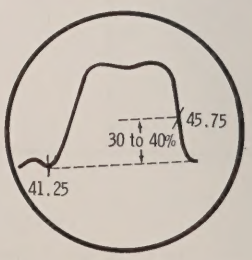

FIG. 9

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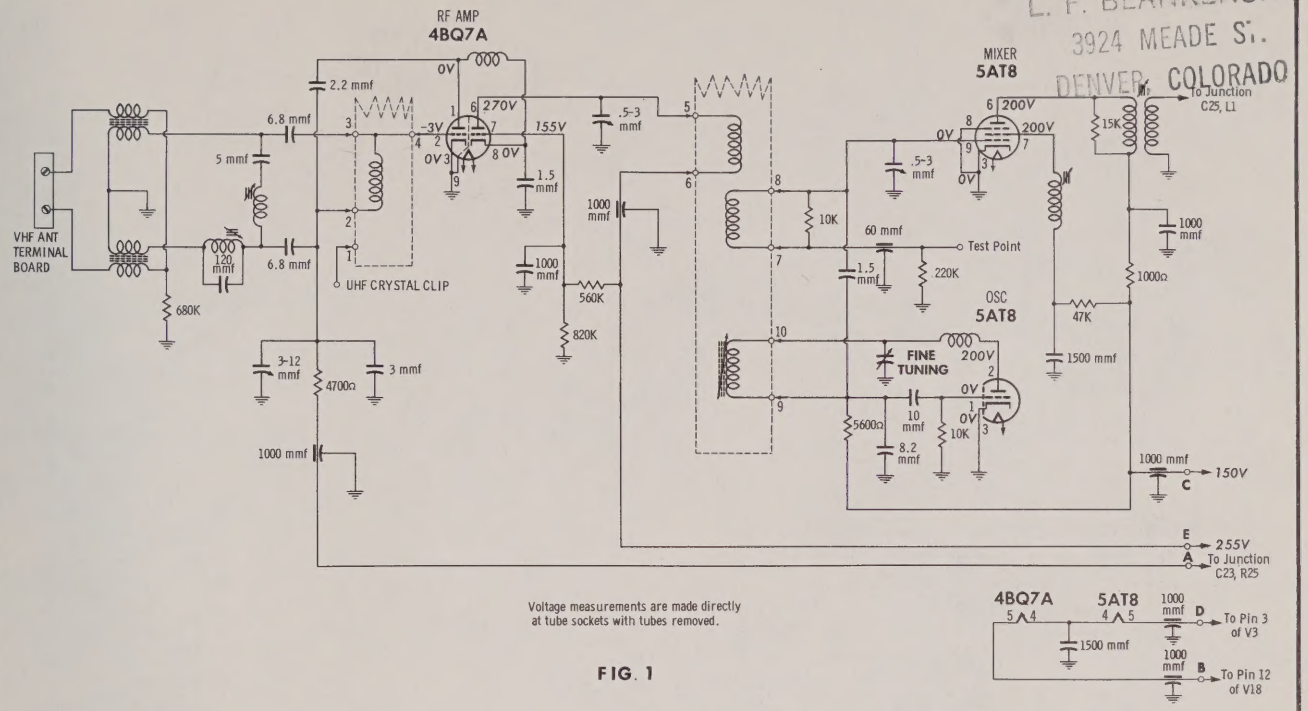

FIG. 1

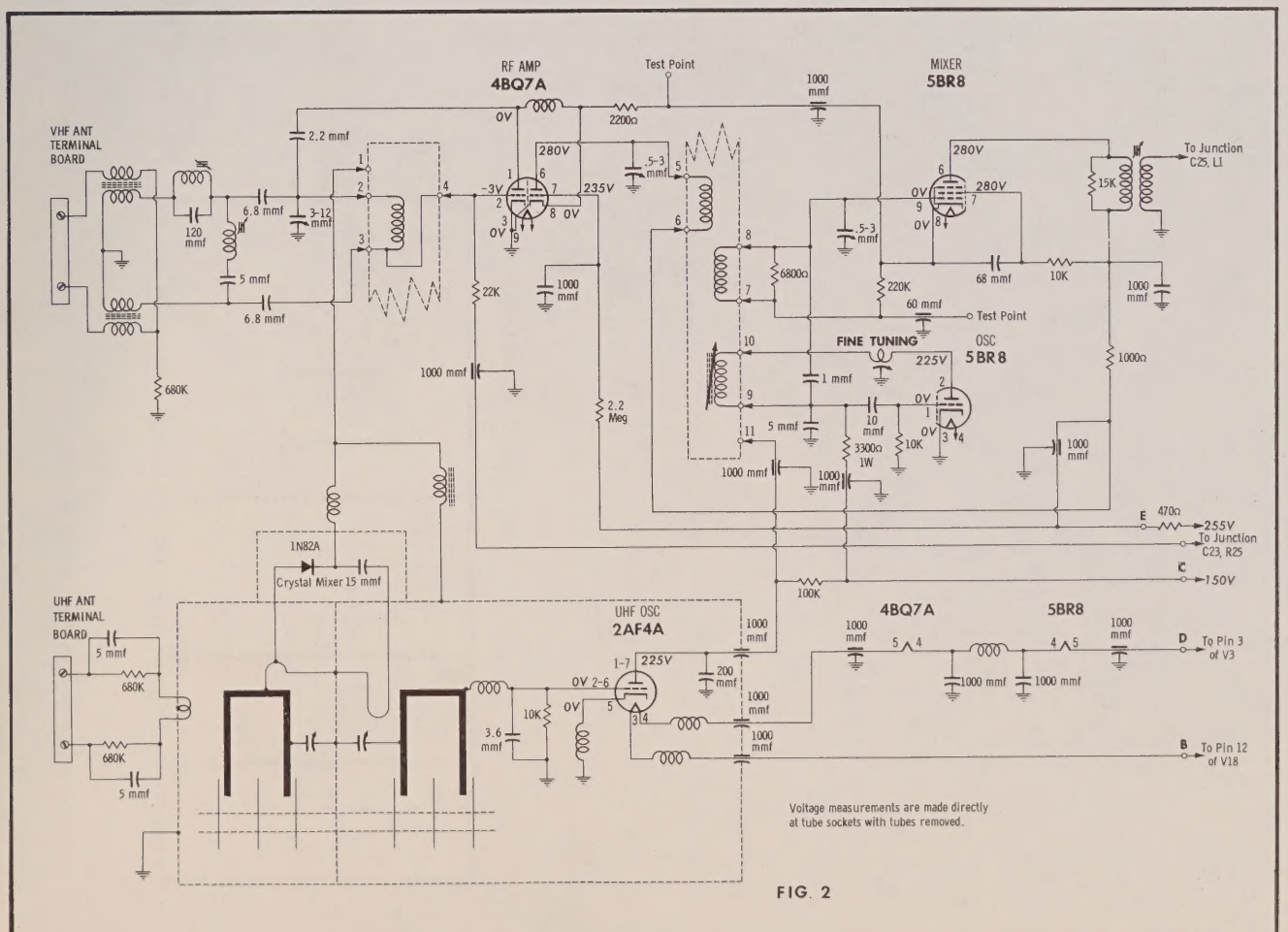

FIG. 2

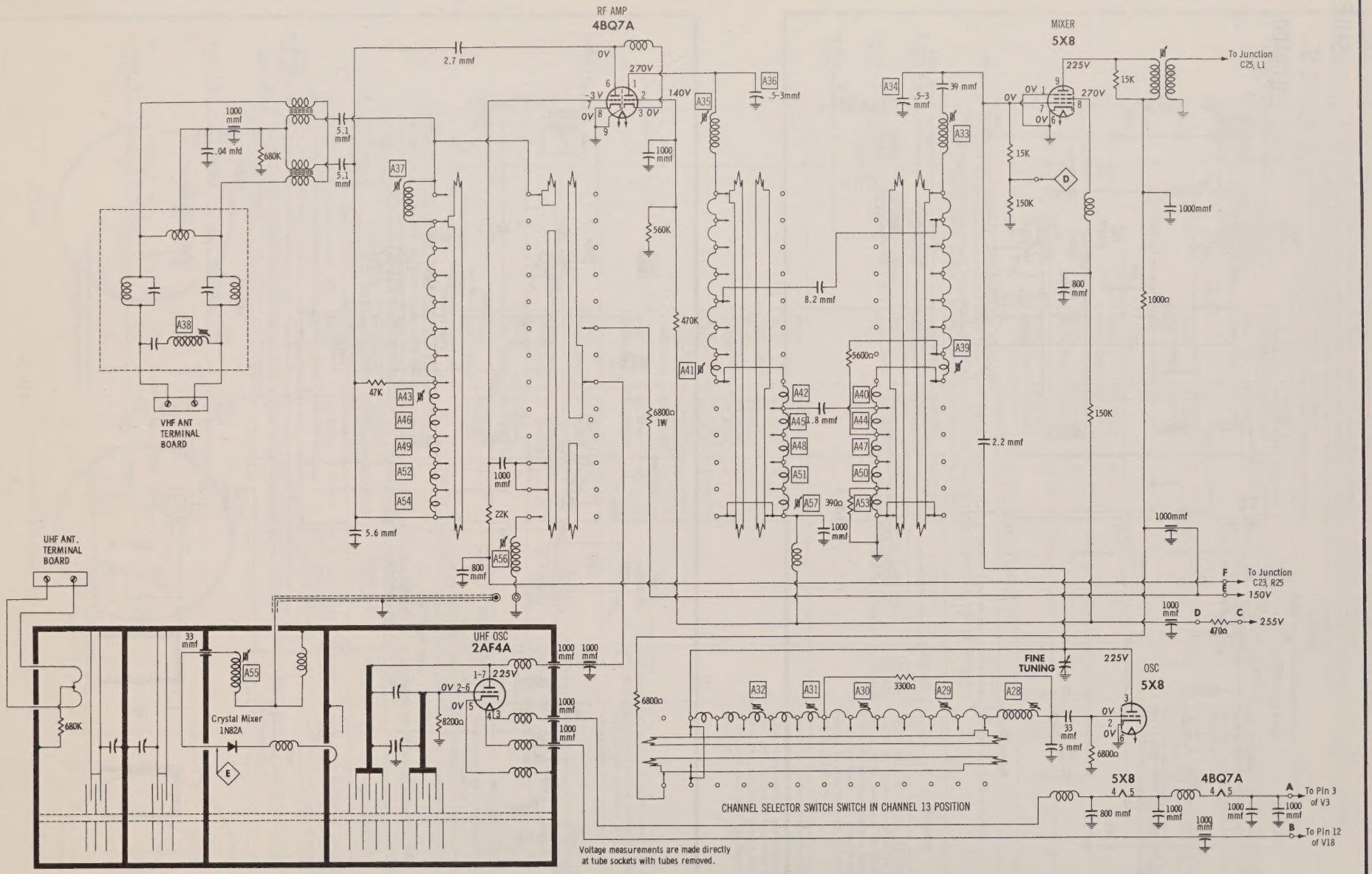
RF AMP
4BQ7A
MIXER
5X8
VHF ANT TERMINAL BOARD
UHF ANT. TERMINAL BOARD
UHF OSC
2AF4A
Crystal Mixer
1N82A
OSC
5X8
FINE TUNING
CHANNEL SELECTOR SWITCH SWITCH IN CHANNEL 13 POSITION
To Junction C25, L1
To Junction C23, R25
150V
255V
To Pin 3 of V3
To Pin 12 of V18
Voltage measurements are made directly at tube sockets with tubes removed.

FIG. 3

BIGG OF CALIF.
MODEL "George Gott" G 30 U

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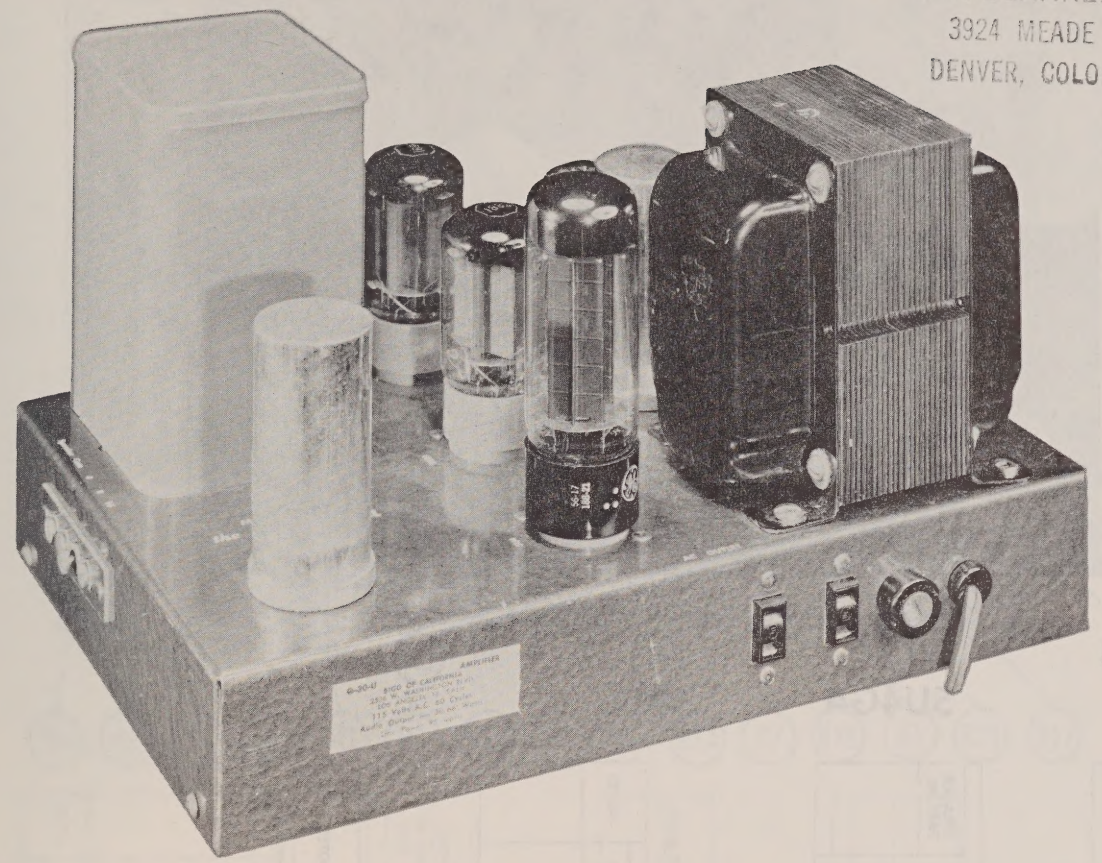
BIGG OF CALIF.
MODEL "George Gott" G 30 U



BIGG OF CALIF.
MODEL "George Gott" G 30 U

TRADE NAME	Bigg of Calif. Model "George Gott" G 30U
MANUFACTURER	Bigg of Calif., 2506 W. Washington Blvd., Los Angeles 18, Calif.
TYPE SET	AC Operated Amplifier
TUBES (Five)	Types 6SN7GT AF Amp.-Phase Inv., 6SN7GT Driver , (2) 5881 Output, 5U4GA Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.23 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

BIGG OF CALIF.
MODEL "George Gott" G 30U

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp.-Phase Inv.	6SN7GT	
V2	Driver	6SN7GT	
V3	Output	5881	

ITEM No.	USE	TYPE	NOTES
V4	Output	5881	
V5	Rectifier	5U4GA	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Bigg of Calif. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰30	450				FP237	TMD-37	Q-045	
B	■30	450				TC495	TD-150-150	MT-15100	
C	▲125	100							
C2A	▰30	450				FP237	TMD-37	Q-045	
B	■30	450				TC495	TD-150-150	MT-15100	
C	▲125	100	(Note 1)						

Note 1. C2C is not used.

FIXED CAPACITORS

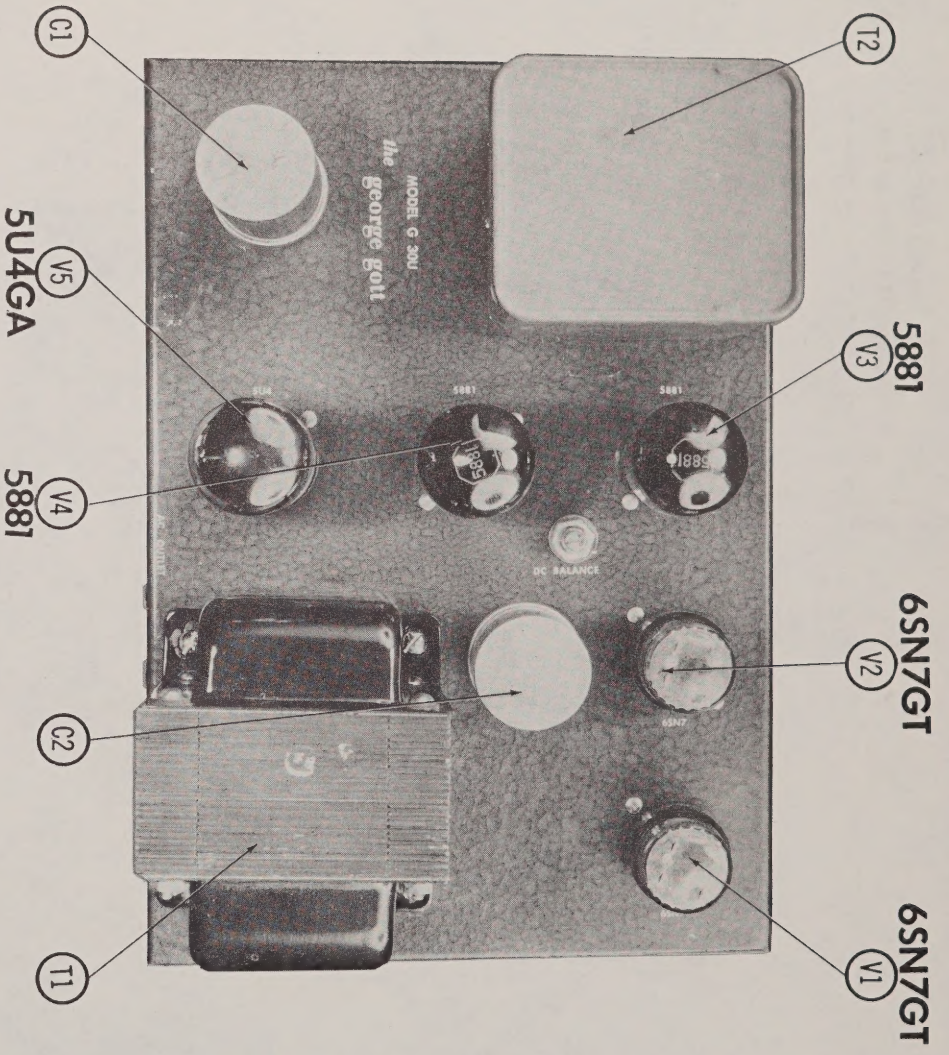
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Bigg of Calif. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C4	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C5	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C6	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C7	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C8	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Bigg of Calif. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3000Ω	2	CM10674	VK133	A43-3000	WPS3000	R3000L	DC Balance (Wire-wound)
B	Shaft		Not Req.	Not Req.	FKS-1/2	Not Req.	Not Req.	Attach to R1A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Bigg of Calif PART No.	IRC PART No.	
R2	1Meg	1		BTA-1Meg	
R3	47K	1		BTA-47K	
R4	470Ω	1		BTA-470	
R5	47K	1		BTA-47K	
R6	22K	1		BTA-22K	
R7	22K	1		BTA-22K	
R8	39K	1		BTA-39K	
R9	39K	1		BTA-39K	
R10	390K	1		BTA-390K	
R11	390K	1		BTA-390K	
R12	560Ω	1		BTA-560	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Bigg of Calif. PART No.	IRC PART No.	
R13	47K	2		BTB-47K	
R14	47K	2		BTB-47K	
R15	1800Ω	1		BTA-1800	
R16	100K	1		BTA-100K	
R17	100K	1		BTA-100K	
R18	1800Ω	1		BTA-1800	
R19	39K	1		BTA-39K	
R20	39K	1		BTA-39K	
R21	350Ω	10		1 3/4A-350	
R22	10K	1		BTA-10K	
R23	1000Ω	5		PW7-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Bigg of Calif. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.23A	800VCT @.142A	5VAC @ 3A	6.3VCT @2.94A	T54486	P9402	P-3155 ①	PC-8412 ①	22R33	R-18A

① Drill new mounting holes.

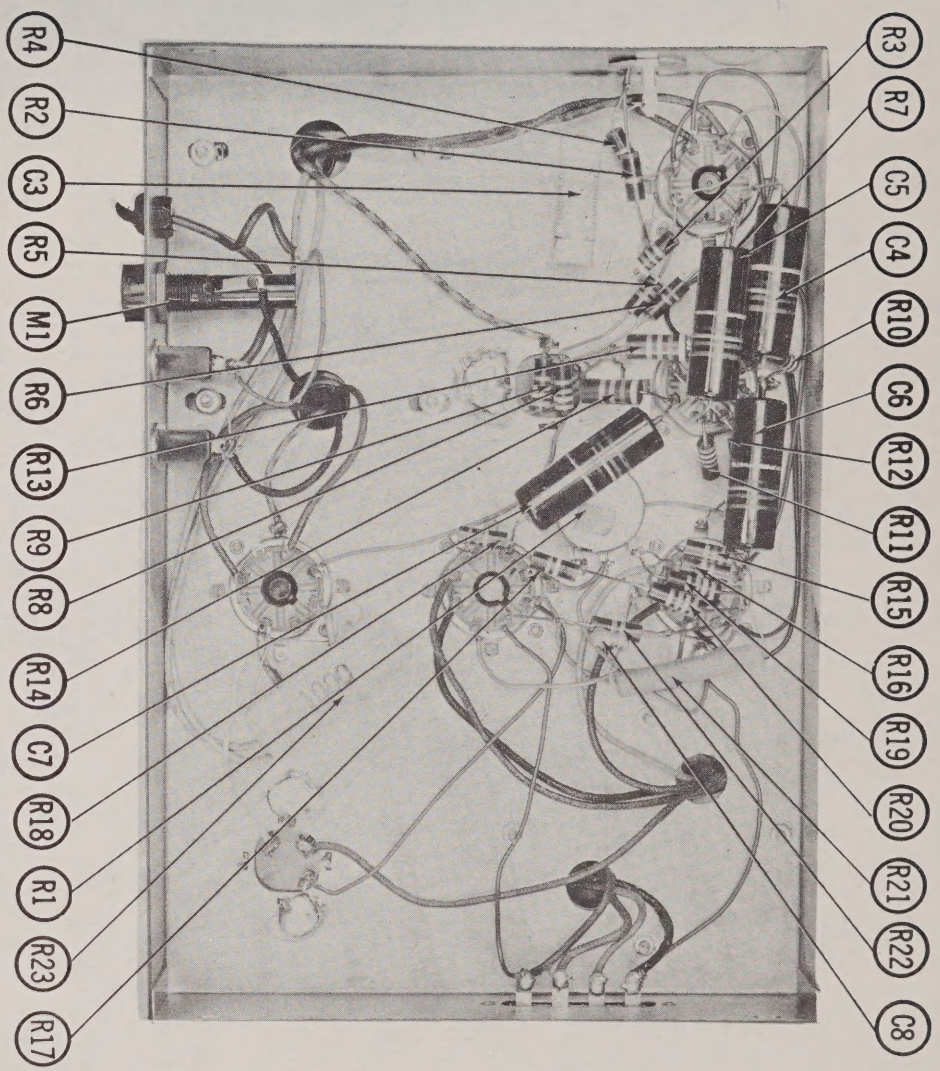
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Bigg of Calif. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	16Ω tap @ 8Ω, 4Ω	T54487	H4103 ①		A-8072①		HSM-186①	① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Bigg of Calif. PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B				313003. (3AG S/B 3A)	341001	MDX 3	HKP

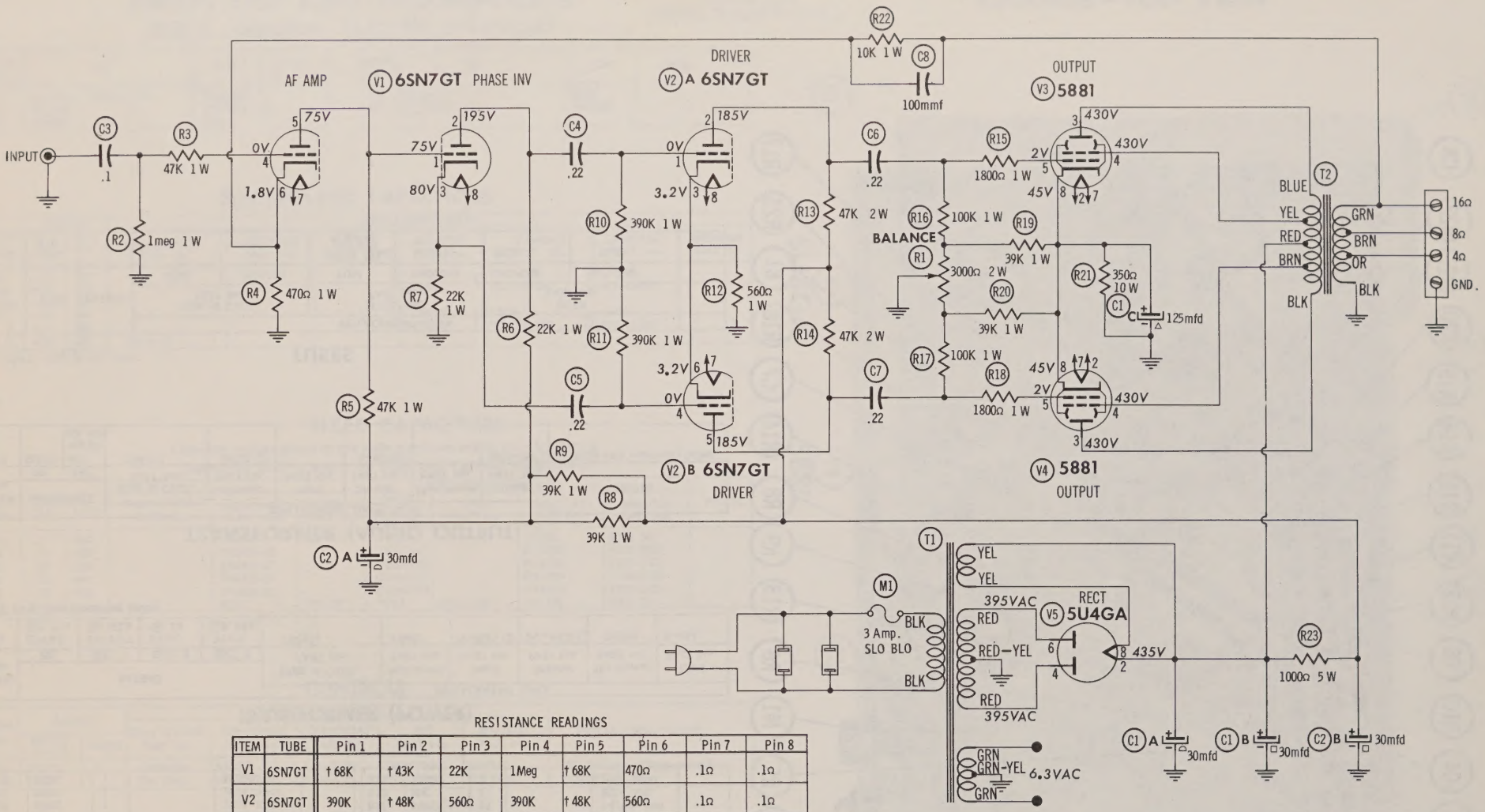
CHASSIS—BOTTOM VIEW



SET 342 FOLDER 2

BIGG OF CALIF.
MODEL "George Gott" G 30U

BIGG OF CALIF.
MODEL "George Gott" G 30U



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6SN7GT	†68K	†43K	22K	1Meg	†68K	470Ω	.1Ω	.1Ω
V2	6SN7GT	390K	†48K	560Ω	390K	†48K	560Ω	.1Ω	.1Ω
V3	5881	TP	.1Ω	†90Ω	†42Ω	102K	TP	.1Ω	350Ω
V4	5881	TP	.1Ω	†90Ω	†40Ω	102K	TP	.1Ω	350Ω
V5	5U4GA	NC	36K	NC	45Ω	NC	42Ω	TP	36K

† MEASURED FROM PIN 2 OF V5.
NC NO CONNECTION.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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COLLARO
MODEL RC-456

FIGURE 1
GENERAL INFORMATION

The Collaro Model RC . 456 Record Changer is designed to give entirely automatic pick-up arm positioning for 7", 10" and 12" records, which (providing they are of the same speed and same type of groove) may be intermixed in any order.

Turntable Speed ---------- 16, 33 1/3, 45 or 78 R. P. M.

Record Capacity ---------- Ten 7", 10", or 12" records.

The tripping method used in the velocity in which the striker arm engages a projection on the turntable hub to start the mechanism into cycle.

Record separation is accomplished by movement of a finger in the center spindle. This finger directly separates records having a 1/4" center hole.

Model RC . 456 automatically shuts off after the last record has been played.

Connect this changer to an outlet supplying 100-125 volts, 60 cycle AC only, unless otherwise specified.

Distributed in U. S. by:

Rockbar Corporation
211 East 37th Street
New York 16, N. Y.

Manufactured by:

Collaro Limited
Ripple Works, By-Pass Road
Barking, Essex

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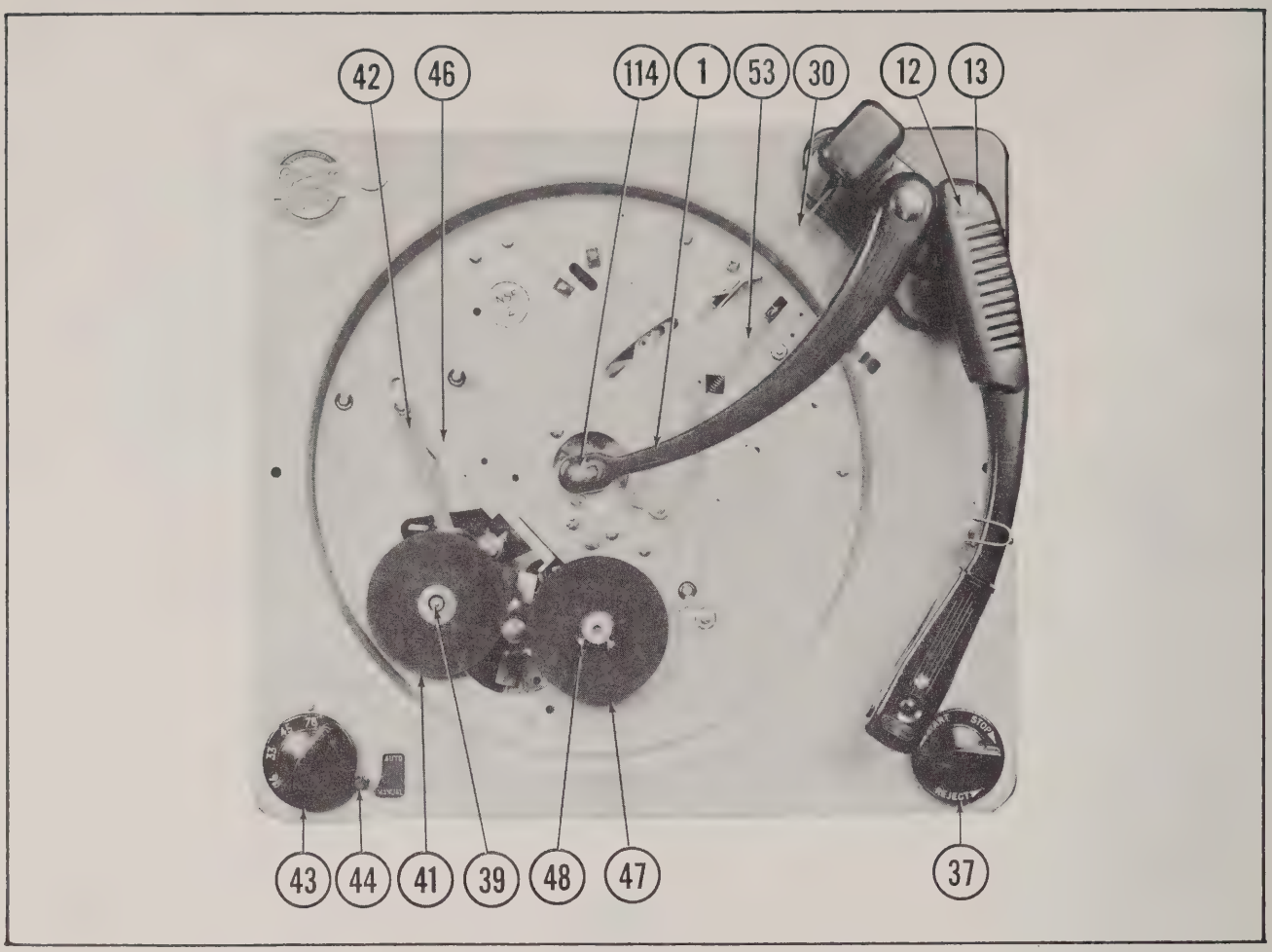

FIGURE 2

OPERATING INSTRUCTIONS

Loading-

1. Hold record balancing arm (1) by the metal clip, lift clear of spindle and swing out over pick-up arm. Place records on spindle and lower to offset step. Holding records level, replace record balancing arm on spindle.

NOTE: 7", 10", and 12" records can be intermixed on this changer, but be certain that they are of the same playing speed and have the same type of groove.

Starting-

To start the machine, after checking that stylus and speed controls are properly set, turn main control (37) to the left and release when the turntable starts to rotate. The changer will operate automatically until the last record has been played, at which time the pick-up arm is returned to its rest and the supply to the motor is switched off.

Manual Operation-

Manual operation is accomplished by moving Auto-Manual lever (44) to the "Manual" position. The purpose of the manual control is to disconnect the changing mechanism so that single records can be played as on a single record player. The pickup will then be free on its rest and can be used as a single record player.

Rejecting-

A record may be rejected at anytime by turning main control (37) fully to the left and releasing. The pick-up arm will immediately lift from the record and the next record will drop to the turntable and commence to play.

Stopping-

The changer may be stopped at any time by turning main control (37) fully to the right and releasing. The pickup arm will immediately lift from the record and return to its rest position, then the supply to the motor will be automatically switched off.

SPECIAL FEATURES

Muting-

The pick-up cartridge is muted during the change cycle, thus avoiding reproduction of undesirable noise during the interval between records, and also avoiding the unpleasant "running down" effect due to slowing of the turntable when a record is rejected or when the "Stop" control is operated.

Retractable Drive-

Rubber tired drive wheels (41 and 47) are automatically retracted when the unit is switched off. The development of flats on the tires, due to prolonged contact under pressure during periods of disuse Noisy running and unevenness of turntable speed is thus avoided.

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[illegible]
[illegible], COLORADO

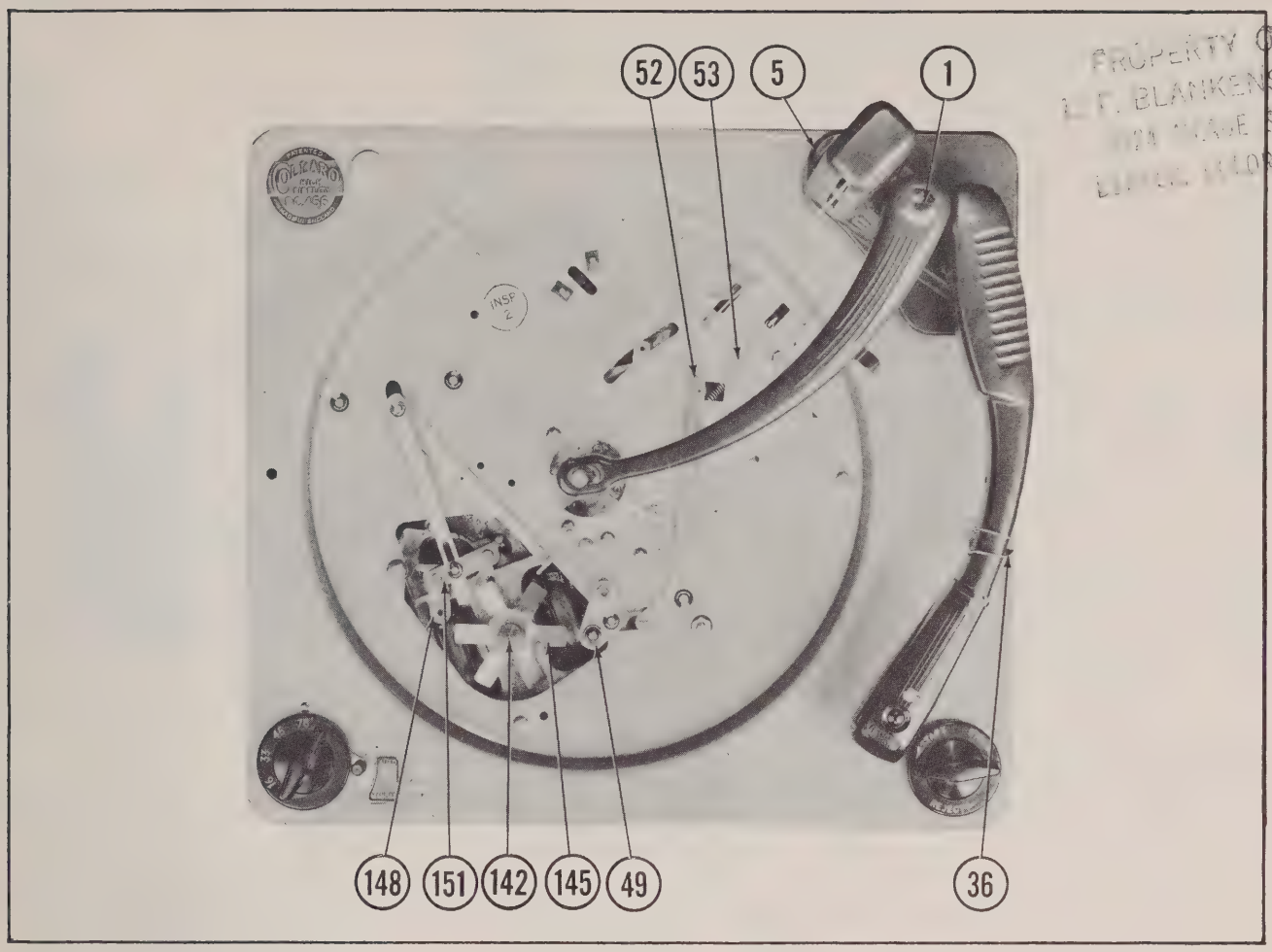

FIGURE 3

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood. This changer is provided with what is known as a "Velocity Trip" mechanism. The change cycle is started by the faster inward motion of the pick-up arm when the needle enters the lead-out grooves at the end of a record.

The pick-up arm assembly and the pick-up tripping arm (24) pushes trip feed lever (67), which, striker arm (102) in toward the turntable hub. Striker arm (102) is fed inward by the friction provided by its own weight resting on the curved end of trip feed lever (67).

While a record is playing, the slight movement of striker arm (102) is not sufficient to trip the mechanism because, on each revolution of the turntable, the wiping action by the turntable hub projection (point "A" on exploded view) moves striker arm (102) back far enough to clear the hub projection.

When the needle enters the lead-out grooves of a record, causing the pick-up arm to advance rapidly toward the spindle, striker arm (102) is moved fast enough and far enough to definitely engage the turntable hub projection (point "A" on exploded view). As the hub projection engages with striker arm (102), the striker arm is pushed away from the turntable hub (toward the pick-up arm) far enough to cause gear release lever actuating link (52) to pivot in such a manner so as to release main gear release lever (136) from the pin located on top of main gear (104). This causes two things to happen. First, it unlocks main gear (104) from its out of cycle position. Secondly, it permits cycle drive wheel (47) and its associated gear train to be pulled into contact with the motor shaft by action of spring (133), thus being in position to drive the mechanism through the change cycle.

As main drive gear (104) starts to rotate, operating bar (91) which is secured in an eccentric position on main drive gear (104), is pulled toward the front of the changer. The pick-up arm actuating lever (74) moves to the front along with operating bar (91) and in so doing, relieves all pressure from the lift pin and muting switch link (93), and from the lift pin and muting switch lever (95). This action permits the lift pin lift spring (26) to raise the lift pin (23), which in turn, raises the pick-up arm from the record.

At the same time, muting switch assembly (96) is closed, shorting out the pickup cartridge, thus preventing any undesirable noises from coming through the amplifier while the mechanism is in cycle.

Simultaneously, the pick-up arm positioning plate (68) moves into contact with the pick-up tripping arm (24). This is the connection that directs the pick-up arm inward, through a friction clutch arrangement, when that phase of the change cycle is reached.

The pick-up arm lateral lever (69) is now pulled forward by the pick-up arm actuating lever (74),

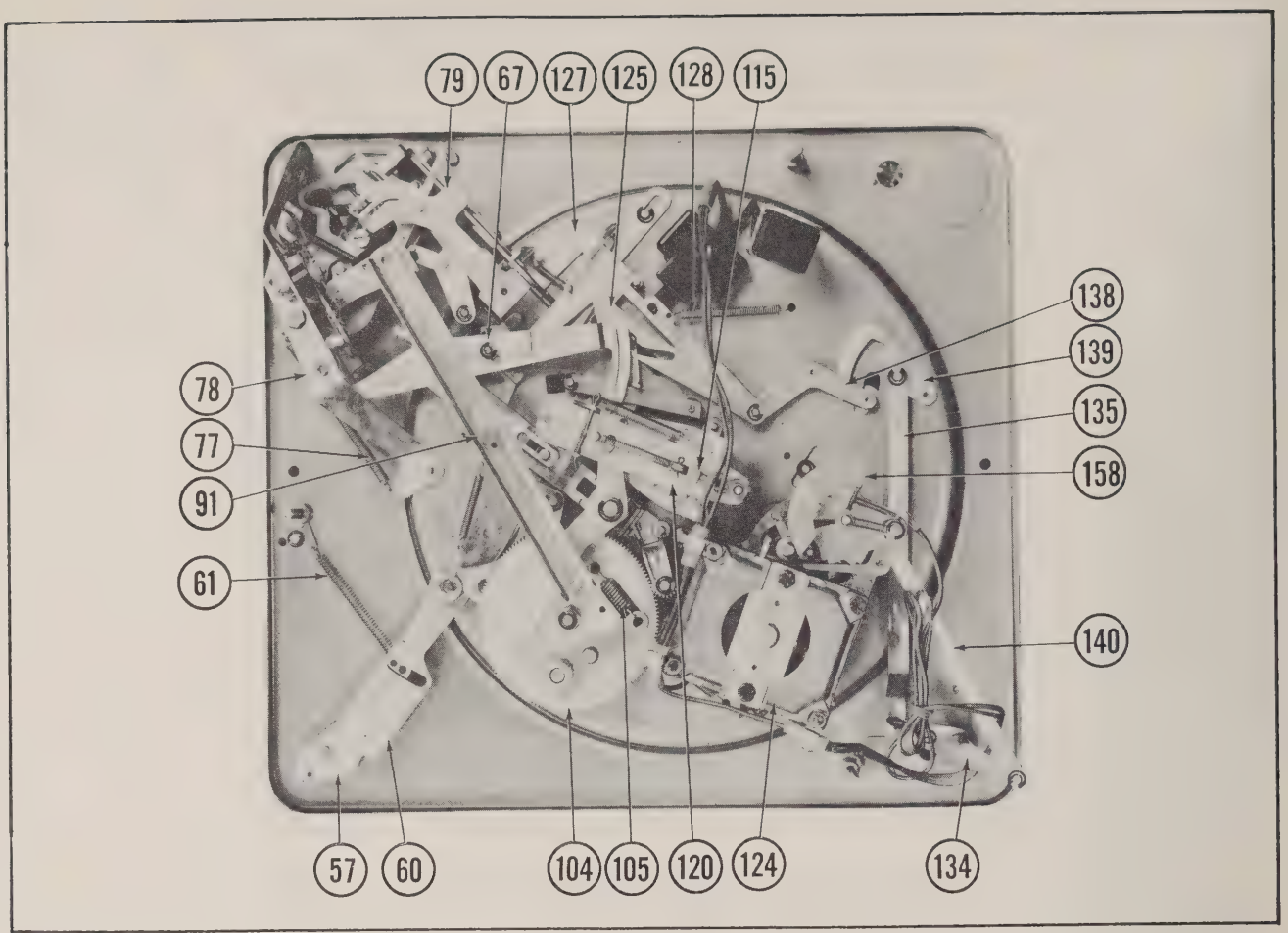

FIGURE 4

swinging the pick-up arm clear of the turntable.

At this time, the roller on the bottom of main drive gear (104) actuates the record dropping lever (166) which in turn, moves the spindle slide plate (120) in such a manner so as to actuate the record selector pawl (119). Selector pawl (119) moves upward until its upper end engages the center hole of the lower-most record in the stack and then moves sideways sufficiently to push the record off the spindle shelf.

The main drive gear (104) has rotated far enough that operating bar (91) has reached its maximum forward travel and now starts moving toward the rear of the changer. As this takes place, the pick-up arm actuating lever (74), which is connected to operating bar (91), also moves toward the rear of the changer. This releases the pick-up arm return lever (89) and through action of the pick-up arm return spring (77) pivots to the rear and in so doing carries the pick-up arm positioning plate (68) with it, which in turn, through the friction clutch arrangement between positioning plate (68) and pick-up tripping arm (24) moves the pick-up arm in over the record.

The mechanism is automatically indexed for the pick-up arm to land on either a 7", 10" or 12" record. This is accomplished by the record gate finger (30). This finger has three positions, upper for 7" set-down, middle for 10" set-down, and lower for 12" set-down. Each time the mechanism goes through a change cycle the pick-up arm lands in the 7" position, unless a 10" or 12" record contacts record gate finger (30). Consequently, the set-down positioning lever (35) blocks the pick-up arm positioning plate (68) at one of three positions, depending on the size record which has been dropped from the spindle shelf.

When the pick-up arm is positioned directly over the record lead-in groove, the pick-up arm actuating lever (74) actuates the lift pin and muting switch link (93), which in turn, pivots the lift pin and muting switch lever (95) downward to lower the pick-up arm to the record.

During the preceding sequence of lowering the arm to the record, muting switch (96) opens and the pick-up cartridge becomes "live" again.

The pin located on top of main drive gear (104) now moves against the main gear locking lever (136) and locks the main gear in the out of cycle position. This action also draws the cycle drive wheel (47) away from the motor shaft, completing the change cycle.

AUTOMATIC STOP

The automatic stop is brought into operation after the last record has been played by reason of the record balancing arm (1) having dropped to its fullest extent. This depresses the auto-stop lever (79) which in turn allows the auto-stop catch plate (80) to fall and retain the pick-up arm return lever (89). The pick-up arm is thus not returned inward over the records, but subsides on to its rest at the end of the change cycle. At the same time the pick-up arm return lever (89), through the medium of the switch-off plate (92), restrains the switch-off link (92) against the pull of

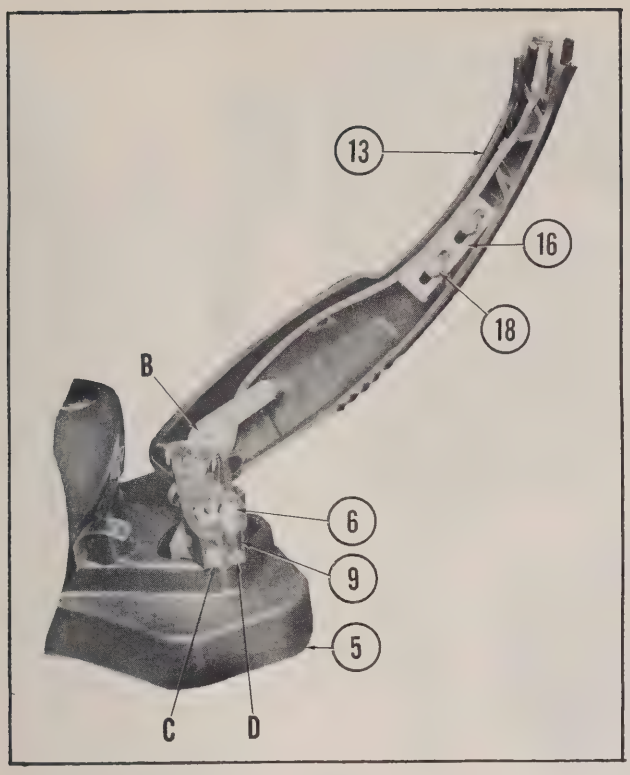

FIGURE 5

spring (113). The turned up end of the switch-off link (82) is thus held in the path of the stud, located on top of operating bar (91), and at the end of the cycle the notch in the switch pawl (127) is disengaged and the switch actuating spring (128) holds the motor switch open and simultaneously retracts idler wheel (41) through the medium of actuating lever (138) and link (42).

On switching on again, stop lever (60) disengages the turned-up end of the switch-off link (82) from the stud on top of operating bar (91) thus allowing the notch in the switch pawl (127) to engage with the pin on the underside of the baseplate so holding the motor switch closed and at the same time holding idler wheel (41) in contact between the motor pulley and turntable rim. If, at the same time, one or more records have been loaded on to the machine, the auto-stop lever (79) will lift under the influence of its spring (53) as soon as the pick-up arm return lever (89) is moved momentarily out of the notch in the auto-stop catch plate (80) during the change cycle. This removes all restraints on the various parts of the mechanism, and the cycle is completed in the normal way. If, however, no records have been loaded on to the machine and the record balancing arm (1) remains dropped to its fullest extent, the pick-up arm return lever (89) will not be released, and the pick-up arm will again subside on to its rest and the machine will switch-off at the completion of the cycle.

The purpose of the small pawl attached to the auto-stop catch plate (80) is to prevent the pick-up arm return lever (89) from being restrained as the last records falls, which would cause the machine to switch off without playing the last record. This pawl thus delays the restraint of the pick-up arm return lever (89) until the next cycle, i.e., after the playing of the last record is completed.

For satisfactory operation it is essential that all parts mentioned above should work absolutely freely, and that spring (53) should positively actuate the auto-stop lever (79) lifting the auto-stop catch plate (80) with it. At the same time, spring (53) must not be so strong as to prevent the weight of the record balancing arm (1) fully depressing the auto-stop lever (79).

ADJUSTMENTS

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Needle Set Down-

If set down positions are erratic, check first of all that the nut shown at point B (Figure 5) is securely tightened.

The position at which the stylus alights on the record may be adjusted, if necessary, by means of the two screws C and D (Figure 5). To bring position in, loosen screw C and tighten screw D the same amount.

NOTE: This adjustment is very sensitive; turn the screws only a small fraction of a turn at a time until the desired adjustment is obtained, and finally check that position is correct after both screws have been firmly tighten. Avoid excessive force when tightening these screws.

This machine gives automatic positioning for 7", 10", and 12" records and the above adjustment effects all positions equally. The design of the mechanism ensures that when the 7" setting down position is correctly adjusted the 10" and 12" position will also be correct.

Pick-Up Arm Height Adjustment-

The height to which the pick-up arm is lifted during the change cycle is controlled by the lift pin (23). To make adjustment, if necessary, switch off the power during the change cycle at the point where the pick-up arm has just swung outward over its rest. The lift pin (23) may then be screwed up or down as required by inserting any suitable pin into the hole drilled near the top of the pin (round projecting end). Correct adjustment is when the pick-up arm clears the top of its rest by approximately 1/8".

Record Dropping Adjustment-

This adjustment should not normally be necessary unless the machine has been dismantled to make replacements. To replace or check adjustment:

1. Remove all records and switch off power.

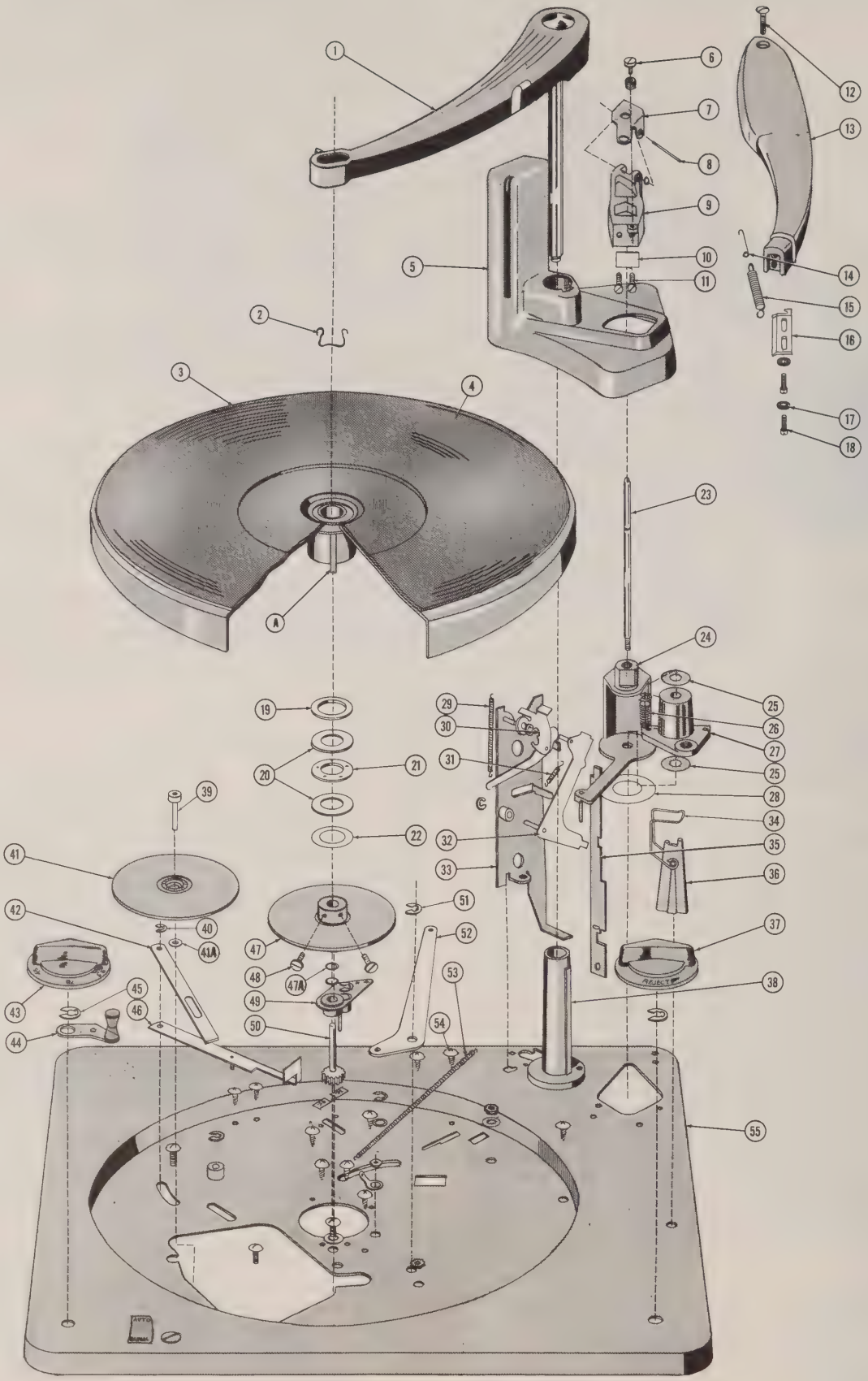
2. Loosen hex head screw, located on bottom of main gear (104), two or three turns.

3. Operate start control.

4. Turn main drive gear (104), by hand, until record dropping lever (166) is moved to its extreme position. The roller on the bottom of main drive gear (104) will then be behind and covered by operating bar (91).

5. Tighten the hex. head screw, located on the bottom of main gear (104), securely.

6. Reconnect power and test with a full load of 12" records.



A PHOTOFACT "EXPLODED" VIEW
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FIGURE 6A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE.

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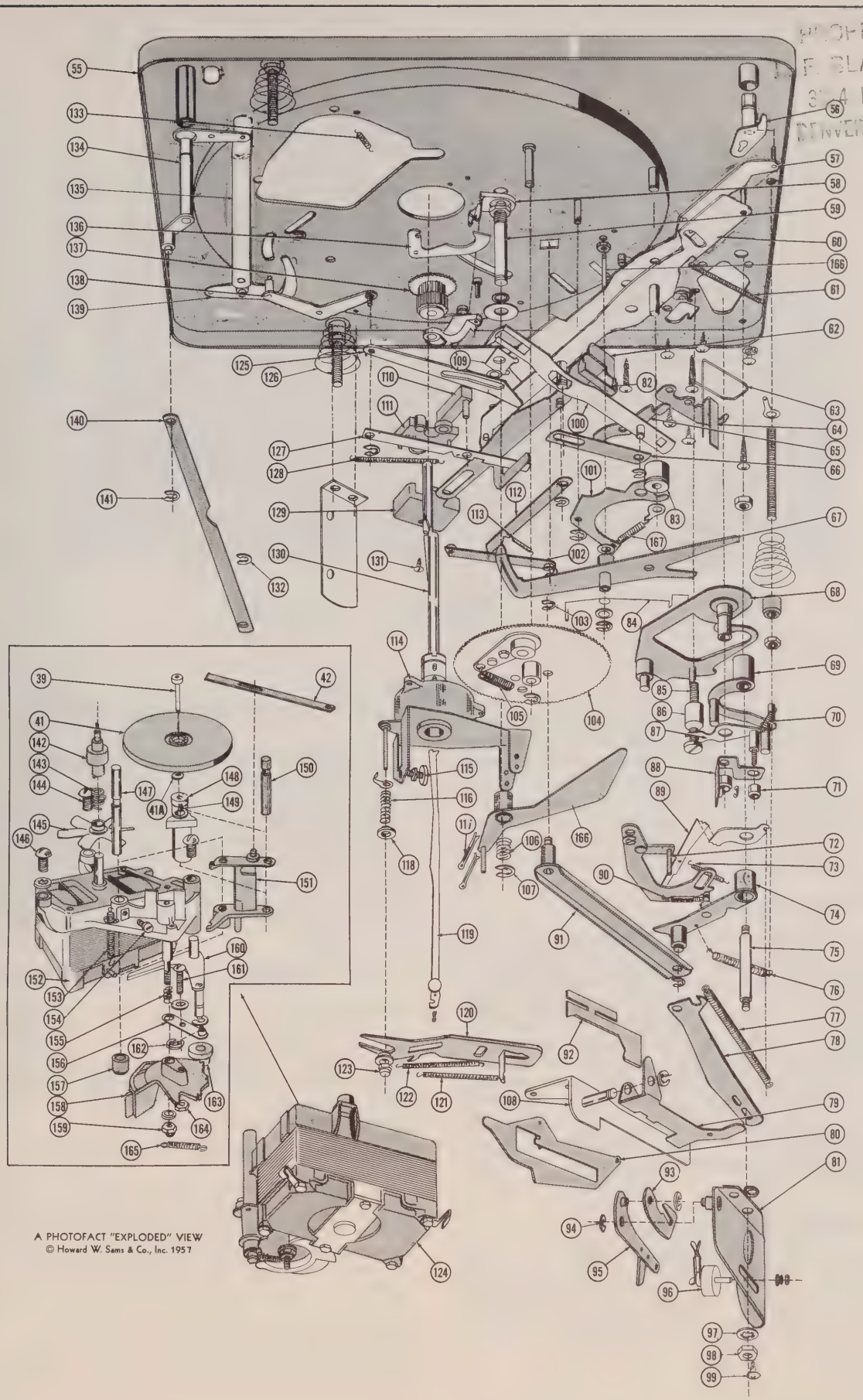


FIGURE 6B. EXPLODED VIEW OF PARTS BELOW BASEPLATE.

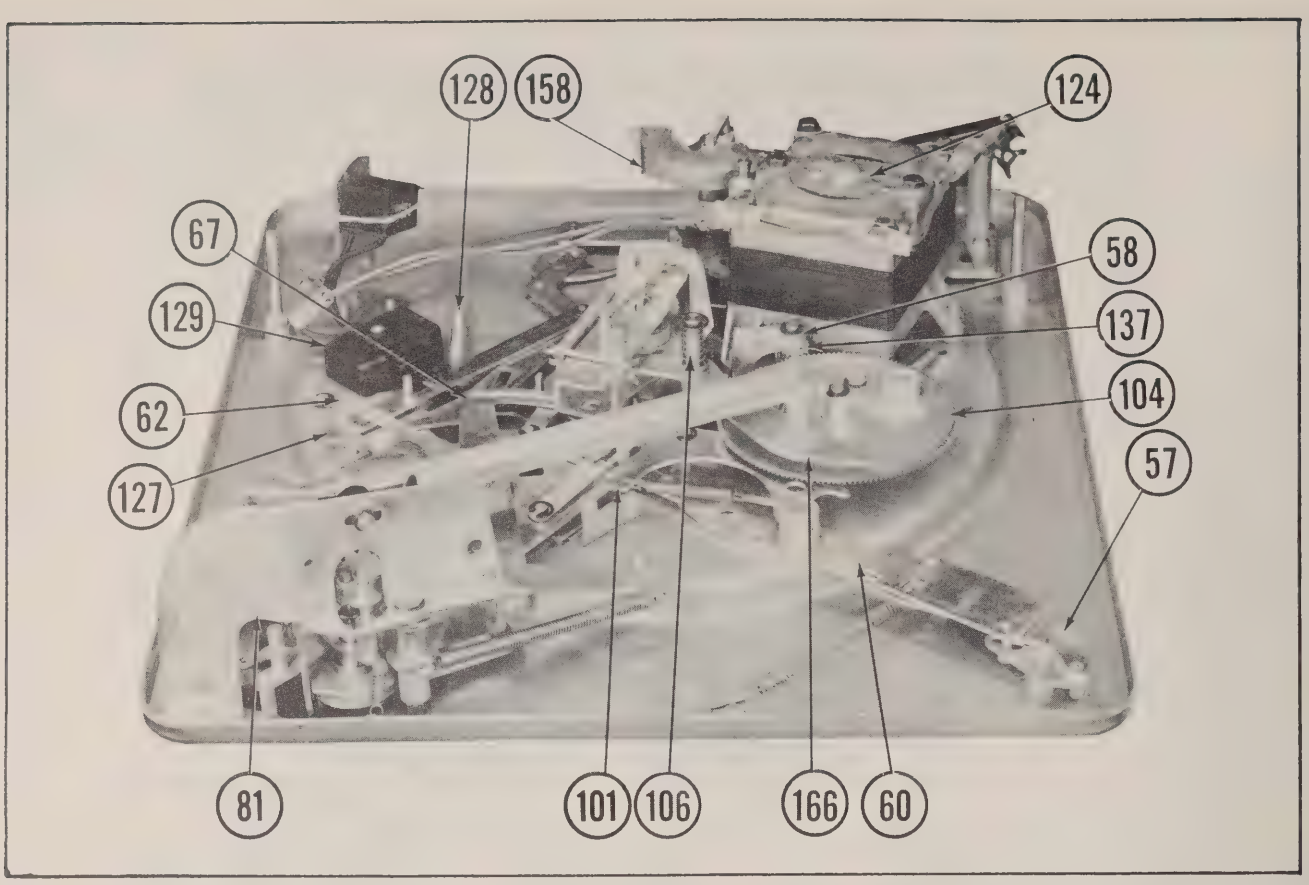


FIGURE 7

CAUTION: The record spindle, dropping mechanism, and turntable bearing housing are built as pre-adjusted unit. Under no circumstance should the nut (123) or the stop (115) be disturbed from their original setting. If damage has occurred or the adjustment disturbed, it is recommended that this mechanism be replaced as a unit.

Automatic Trip Adjustment-

This is of the "Velocity Trip" variety and is designed to be extremely light and sensitive in operation. No adjustment is provided, and the only likely cause of failure is of the cruved end of the feed lever (67) has been accidentally bent upwards or downward so that the end of the striker arm (102) cannot work freely in the aperture in the side of the diecast housing carrying the turntable bearing, etc. Both the feed lever (67) and striker arm (102) must be absolutely free on their respective pivots. It is also worthy to note that the long pin on the front of pick-up tripping arm (24) must always lie within the forked end of trip feed lever (67).

Needle Pressure Adjustment-

Set the weight compensating control (16) in the "LP" position. Use a suitable gram scale and check the needle pressure at the point where the needle lands on the record. When the needle pressure is obtained for the "LP" position, the pressure for the "Std." position will also be correct.

(Refer to Figure 5) loosen screws (18) and move weight compensating control (16) back or forward to obtain the desired pressure.

MAINTENANCE OF MOTOR AND TURNTABLE DRIVE

No lubrication of the motor is normally required as it is fitted with self-oiling bearings. The only maintenance necessary consists of occasional removal of the turntable to clean its inter rim and the driving surfaces of the motor pulley and idler wheel, by wiping with a clean solvent-moistened rag. The thrust washers and ball race located under the turntable should also be examined, and if necessary, washed clean with a petroleum solvent and relubricated with a small amount of soft grease.

TROUBLES AND REMEDIES

If records fail to drop from the spindle shelf, worn or chipped center holes can be the cause and the use of records damaged in this way should be avoided. If failure occurs when using undamaged records, check adjustment of record dropping mechanism as described under "Record Dropping Adjustment."

More Than One Record Drops At A Time-

Worn or chipped center holes may be the cause. Also make sure that the small sliding member housed in the top of the spindle drops freely under its own weight. If not, it is probable that some foreign matter has become lodged between the slide and side of the groove in which it works, and this may best be dislodged by means of a razor blade. Grease or oil on the slide may also be the cause of its failure to drop freely, and consequently great care should be exercised if the turntable is removed to avoid depositing any oil on the slide from the turntable bearing. A petroleum solvent applied with a small brush should be used to clean the parts if this cause of failure is suspected.

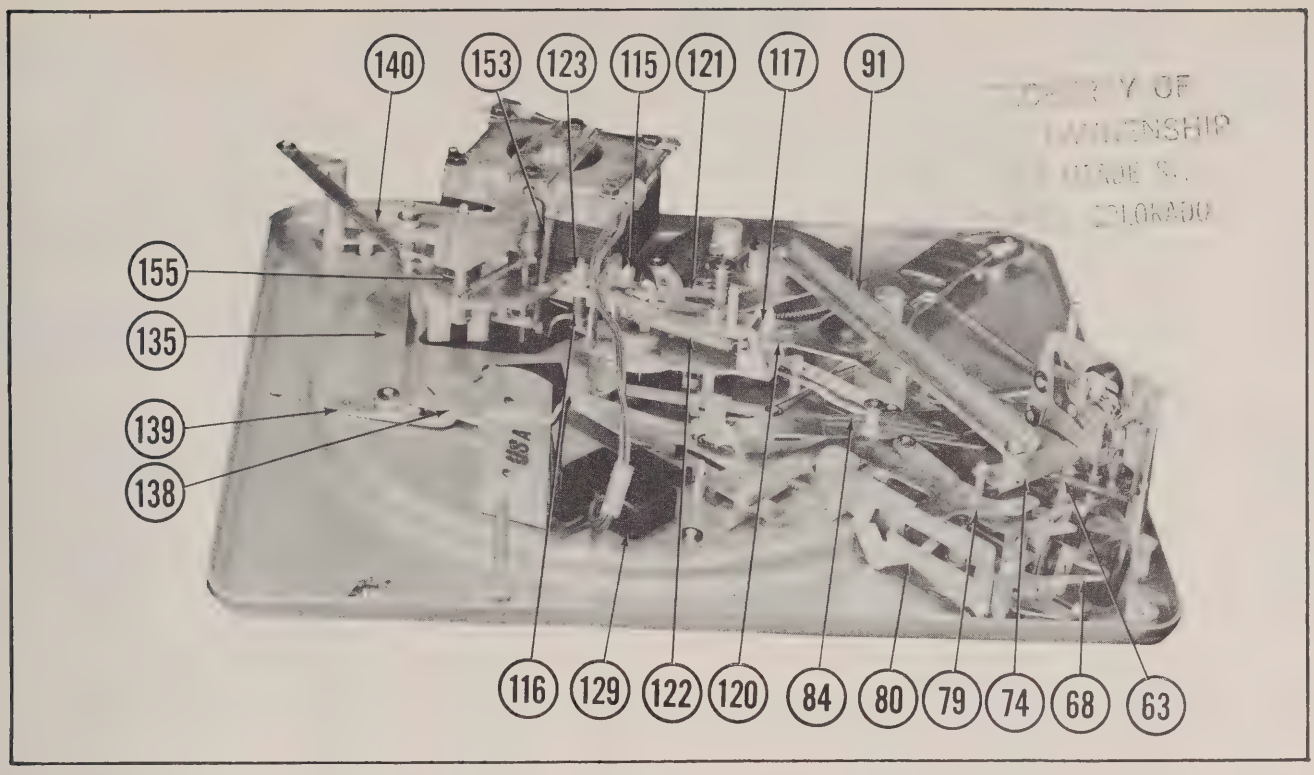


FIGURE 8

Changer Fails To Shut-Off After Last Record Has Been Played-

1. Record balancing arm (1) is not falling to its fullest extent and making contact with auto-stop lever (79). This could be due to the balancing arm shaft (1) sticking in its housing, and this should be freed by cleaning thoroughly. Remove the shaft, if necessary, by first removing the "C" washer at the bottom of the shaft. Do not lubricate.

Check that parts (62, 112, 79 and 80) are free on their respective pivots.

Pick-Up Arm Does Not Track Across Record Properly-

1. Needle worn or clogged by an accumulation of lint, dirt, etc.

2. Make certain that the proper needle is used for the type record being played.

3. Check that the pick-up arm pivots freely and that its movement is not retarded by pick-up leads which are too tight.

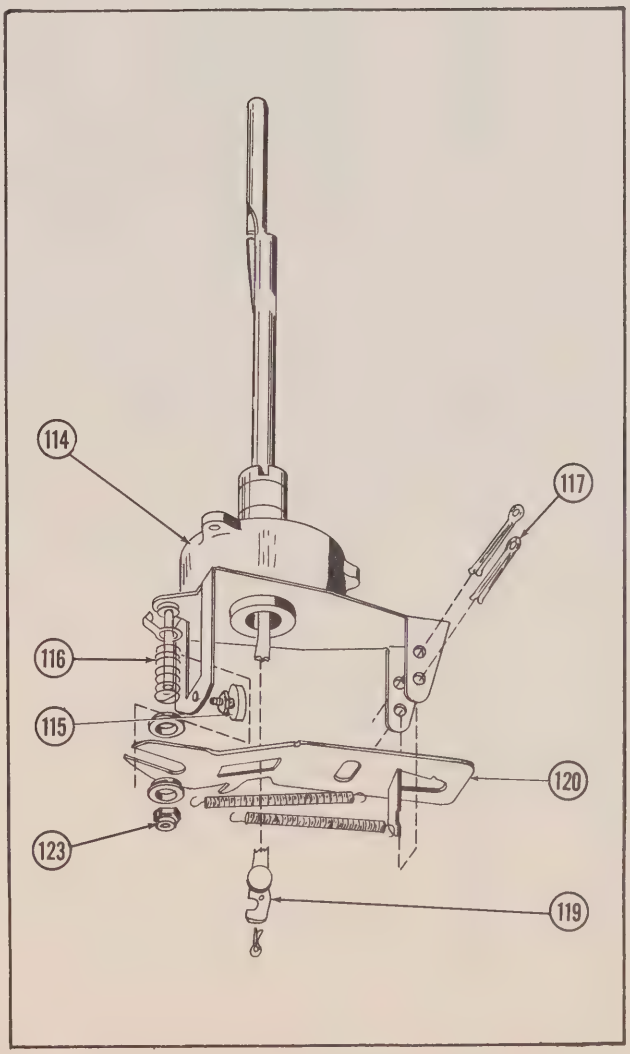
Continuous Operation Of Change Cycle-

If the change mechanism operates continuously without allowing each record to play to the end the cause can be:

1. Weakening or displacement of spring (133).

2. Main gear release lever (136) being stiff on its pivot.

3. Automatic trip lever (52) being stiff on its pivot.



RECORD DROPPING MECHANISM

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	56-1	Record Balancing Arm
2	56-2	Turntable Retainer
3	56-3	Turntable Assembly
4	56-4	Rubber Mat
5	56-5	Pick-up Base & Set-Down Selector Housing
6	56-6	Pick-up Arm Depth Adj. Screw
7	56-7	Pick-up Arm Mounting Bracket
8	56-8	Hinge Pin
9	56-9	Pick-up Arm Hinge
10	56-10	Set-Down Positioning Shim
11	56-11	Needle Set Down Adj. Screws
12	56-12	Pick-up Arm Mounting Screw
13	56-13	Pick-up Arm Shell
14	56-14	Weight Compensating Link
15	56-15	Weight Compensating Spring
16	56-16	Weight Compensating Control
17	56-17	Lockwasher
18	56-18	Weight Compensating Control Adj. Screw
19	56-19	Rubber Washer
20	56-20	Turntable Bearing Washers (Steel)
21	56-21	Bearing (Ball Race)
22	56-22	Neoprene Washer
23	56-23	Pick-up Arm Lift Pin
24	56-24	Pick-up Tripping Arm
25	56-25	Flat Washer (Steel)
26	56-26	Lift Pin Lift Spring
27	56-27	Pick-up Arm Mounting Base
28	56-28	Clutch Washer (Felt)
29	56-29	Record Gate Finger Lift Spring
30	56-30	Record Gate Cam & Finger
31	56-31	Record Gate Lever Actuating Spring
32	56-32	Record Gate Lever
33	56-33	Record Gate Assy. Mtg. Brkt.
34	56-34	Lock Assembly
35	56-35	Set-Down Positioning Lever
36	56-36	Rest Post
37	56-37	Start-Stop-Reject Knob
38	56-38	Balancing Arm Column
39	56-39	Idler Wheel Mounting Pin
40	56-40	"C" Washer
41	56-41	Motor Idler Wheel
41A	56-41A	Washer
42	56-42	Idler Wheel Retracting Link
43	56-43	Speed Control Knob
44	56-44	Auto-Manual Lever
45	56-45	"C" Washer
46	56-46	Cycle Delay Lever
47	56-47	Cycle Drive Wheel
48	56-48	Drive Wheel Mtg. Screw
49	56-49	Drive Wheel Swing Bracket
50	56-50	Drive Wheel Mtg. Shaft & Gear
51	56-51	"C" Washer
52	56-52	Automatic Trip Lever
53	56-53	Automatic Stop Lever Spring
54	56-54	Screw
55	56-55	Baseplate
56	56-56	Start-Stop-Reject Shaft & Cam
57	56-57	Reject Lever
58	56-58	Dropping Stud Stabilizing
59	56-59	Record Dropping Lever Mtg. Stud
60	56-60	Stop Lever
61	56-61	Idler Wheel Actuating Link
62	56-62	Switch-Off Link
63	56-63	Set-Down Selector Wire
64	56-64	Selector Wire Mounting Brkt.
65	56-65	Manual Stop Actuating Lever
66	56-66	Spindle Deactivating Link
67	56-67	Trip Feed Lever
68	56-68	Pick-up Arm Positioning Plate
69	56-69	Pick-up Arm Lateral Lever
70	56-70	Spring
71	56-71	Spacer
72	56-72	Record Gate Reset Lever
73	56-73	Positioning Plate Spring
74	56-74	Pick-up Arm Actuating Lever
75	56-75	Mounting Stud
76	56-76	Spring
77	56-77	Pick-up Arm Return Lever Spring
78	56-78	Strengthener
79	56-79	Auto-Stop Lever
80	56-80	Auto-Stop Catch Plate
81	56-81	Muting Switch Mtg. Bracket
82	56-82	Switch-Off Link Pivot Bracket
83	56-83	Spacer
84	56-84	Spring
85	56-85	Pressure Lever Adj. Screw
86	56-86	Spacer
87	56-87	Pressure Lever
88	56-88	Lift Pin Mtg. Bracket
89	56-89	Pick-up Arm Return Lever
90	56-90	Spring
91	56-91	Operating Bar
92	56-92	Switch-Off Plate
93	56-93	Lift Pin & Muting Switch Actuating Link
94	56-94	"C" Washer
95	56-95	Lift Pin & Muting Switch Actuating Lever Assembly
96	56-96	Muting Switch Assembly
97	56-97	Lockwasher
98	56-98	Hex Nut
99	56-99	Screw
100	56-100	Spindle Deactivating Lever
101	56-101	Switch-off Lever
102	56-102	Switch-off Link
103	56-103	"C" Washer
104	56-104	Main Drive Gear
105	56-105	Main Drive Gear Spring
106	56-106	Compression Spring
107	56-107	"C" Washer
108	56-108	Auto-Stop Lever Mtg. Bracket
109	56-109	Spindle Deactivating Slide Plate
110	56-110	Switch Actuating Cam
111	56-111	On-Off Switch
112	56-112	Switch-off Link
113	56-113	Switch-off Link Spring
114	56-114	Turntable Axle
115	56-115	Record Dropping Adj. Screw
116	56-116	Compression Spring
117	56-117	Cotter Key
118	56-118	Shoulder Washer
119	56-119	Record Selector Pawl
120	56-120	Spindle Slide Plate
121	56-121	Selector Pawl Return Spring
122	56-122	Spindle Slide Plate Return Spring
123	56-123	Locknut
124	56-124	Motor Assembly

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
125	56-125	Idler Wheel Actuating Link
126	56-126	Mounting Spring
127	56-127	Switch Pawl
128	56-128	Switch & Idler Wheel Actuating Spring
129	56-129	Switch Cover
130	56-130	Spindle Body
131	56-131	Screw
132	56-132	"C" Washer
133	56-133	Cycle Drive Wheel Actuating Spring
134	56-134	Speed Control Crank
135	56-135	Auto & Manual Actuating Link
136	56-136	Main Gear Release Lever
137	56-137	Intermediate Cycling Gear
138	56-138	Idler Wheel Actuating Lever
139	56-139	Auto & Manual Actuating Lever
140	56-140	Speed Control Lever
141	56-141	"C" Washer
142	56-142	Motor Pulley
143	56-143	Coupling Spring
144	56-144	Motor Mtg. Screw
145	56-145	Fan
146	56-146	Motor Screw
147	56-147	Spindle
148	56-148	Idler Swivel Arm
149	56-149	Swivel Arm Set Screw
150	56-150	Idler Slide Arm Spindle
151	56-151	Idler Slide Arm
152	56-152	Motor
153	56-153	Slide Arm Return Spring
154	56-154	Slide Arm Set Screw
155	56-155	Compression Spring
156	56-156	Speed Control Link
157	56-157	Thrust Collar
158	56-158	Speed Control Cam
159	56-159	Locknut
160	56-160	Cam Lever
161	56-161	Control Link Mtg. Screw
162	56-162	"C" Washer
163	56-163	Cam Index Roller
164	56-164	Hex Nut
165	56-165	Index Spring
166	56-166	Record Dropping Lever

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CRAFTSMEN
MODEL CT2

CRAFTSMEN
MODEL CT2

TRADE NAME	Craftsmen Model CT2		
MANUFACTURER	Radio Craftsmen Inc., 4323 W. Jefferson Blvd., Los Angeles 16, Calif.		
TYPE SET	AC Operated FM-AM Tuner		
TUBES	Thirteen		
POWER SUPPLY	105-125 Volts AC - 60 Cycles	RATING	.45 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	530KC - 1620KC	-FM	88MC - 108MC

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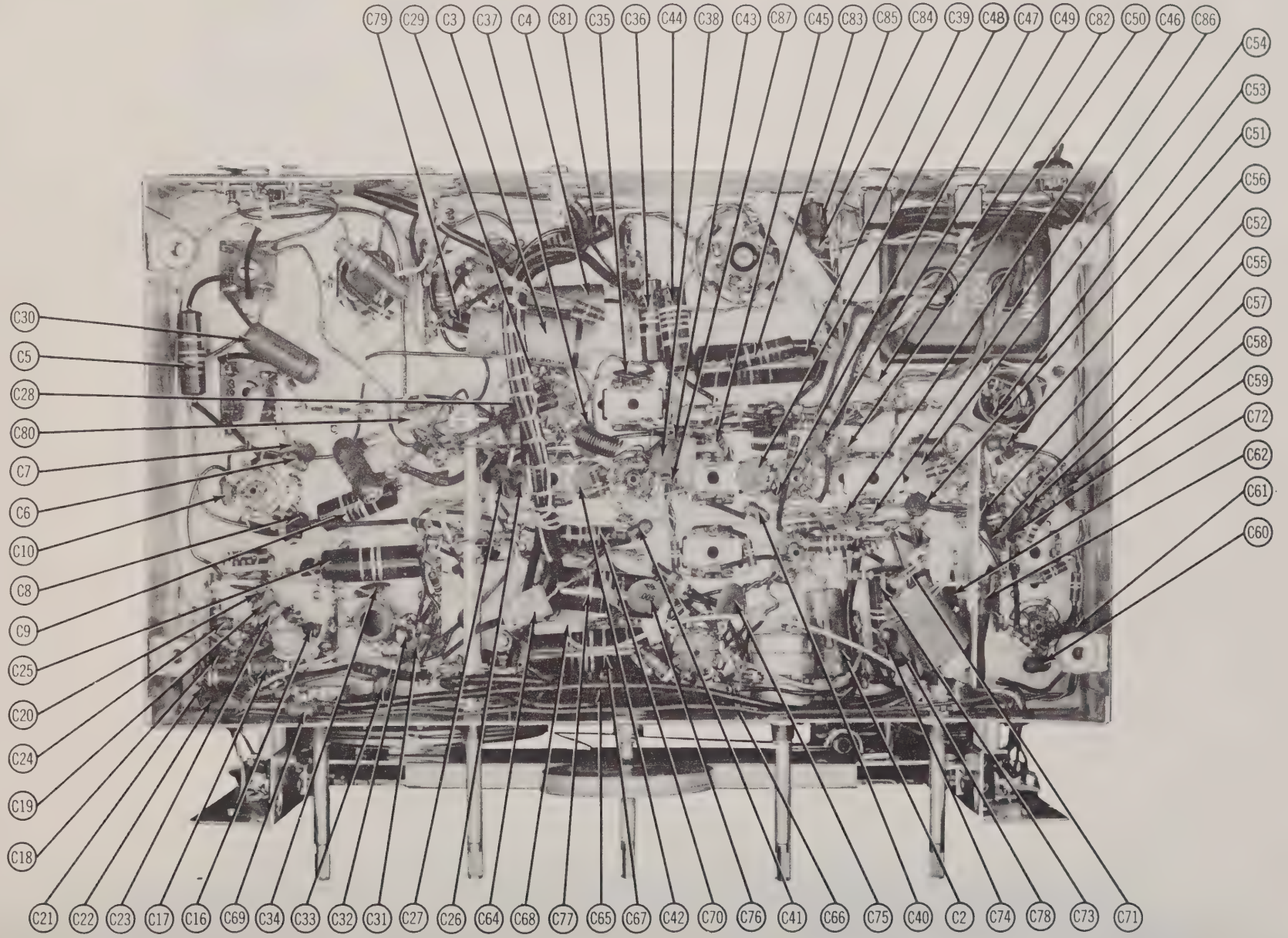
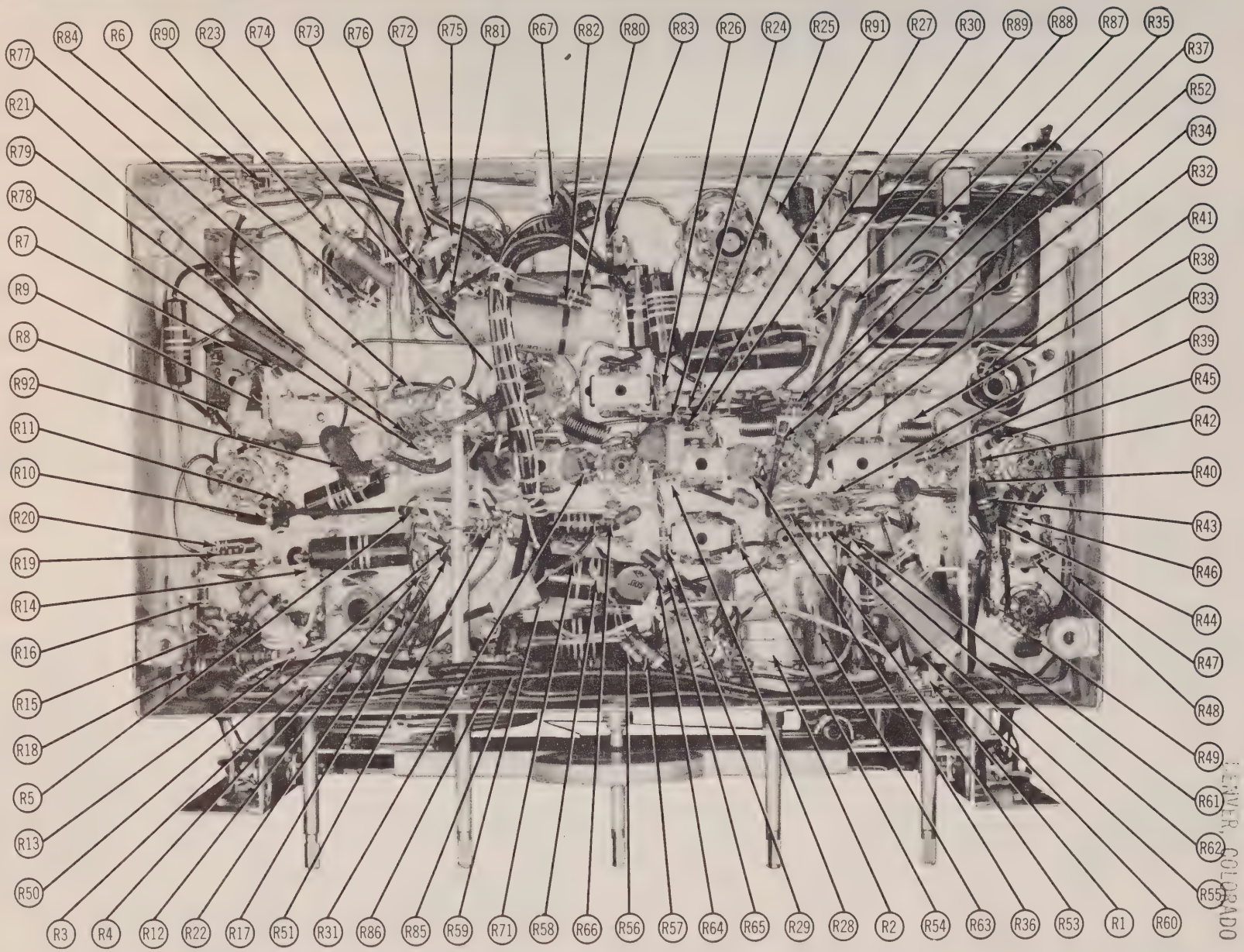


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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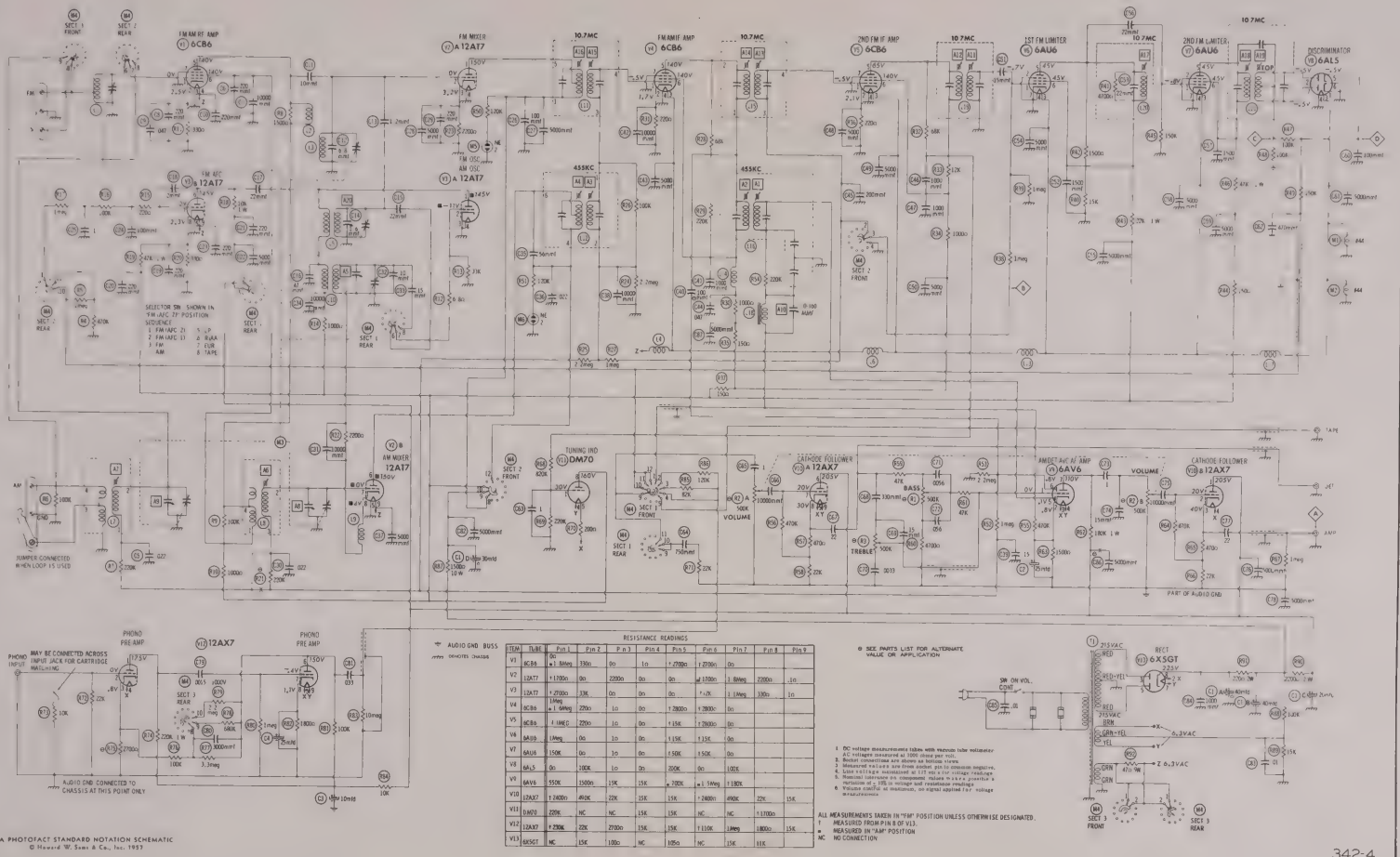

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	0Ω ▲1.5Meg	330Ω	0Ω	1Ω	↑270Ω	↑270Ω	0Ω		
V2	12AT7	↑100Ω	0Ω	220Ω	0Ω	0Ω	▲100Ω	1.8Meg	220Ω	.1Ω
V3	12AT7	↑270Ω	33K	0Ω	0Ω	0Ω	↑2K	1.1Meg	330Ω	1Ω
V4	6CB6	1Meg ▲1.5Meg	270Ω	1Ω	0Ω	↑280Ω	↑280Ω	0Ω		
V5	6CB6	↑1MEG	270Ω	1Ω	0Ω	↑15K	↑280Ω	0Ω		
V6	6AU6	1Meg	0Ω	1Ω	0Ω	↑15K	↑15K	0Ω		
V7	6AU6	150K	0Ω	1Ω	0Ω	↑50K	↑50K	0Ω		
V8	6AL5	0Ω	100K	1Ω	0Ω	250K	0Ω	100K		
V9	6AV6	550K	1500Ω	15K	15K	▲700K	▲1.5Meg	↑180K		
V10	12AX7	↑240Ω	450K	22K	15K	15K	↑240Ω	450K	22K	15K
V11	DM70	220K	NC	NC	15K	15K	NC	NC	↑170Ω	
V12	12AX7	↑230K	22K	270Ω	15K	15K	↑110K	1Meg	180Ω	15K
V13	6X5GT	NC	15K	100Ω	NC	105Ω	NC	15K	11K	

1 DC voltage measurements taken with vacuum tube voltmeter
AC voltages measured at 1000 cycles per sec.
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative.
4 Line voltage maintained at 117 volts for voltage readings
5 Resistance values on components values in ohms, k=1000, M=1,000,000
Tolerance of ±5% in voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
↑ MEASURED FROM PIN 8 OF V13.
▲ MEASURED IN "AM" POSITION
NC NO CONNECTION

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	455KC (400% Mod)	AM	Point of non-interference.	AC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	220MMF	High side to AM antenna input. Low side to chassis.	1500KC	"	1500KC	"	A5	"
3.	"	"	600KC	"	Tune to 600KC signal.	"	A6, A7	"
4.	"	"	1400KC	"	Tune to 1400KC signal.	"	A8, A9	"

10KC WHISTLE FILTER ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	220MMF	High side to AM antenna input. Low side to chassis.	1400KC (10KC Mod)	AM	Tune to 1400KC signal.	AC probe to point Ⓐ. Common to chassis.	A10	Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A17, A18	"
8.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A11, A12 A13, A14 A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A17, A18	"
8.	"	"	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A19	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω carbon resistor	High side thru 270Ω to FM antenna input. Low side to chassis.	106MC	FM	106MC	AC probe to point Ⓐ. Common to chassis.	A20	Adjust for maximum deflection.
10.	"	"	90MC	"	90MC	"	L1, L3	Adjust L1 and L3 for maximum deflection by compressing or expanding coil turns.

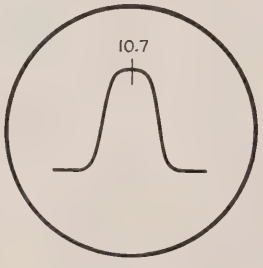


FIG. 1

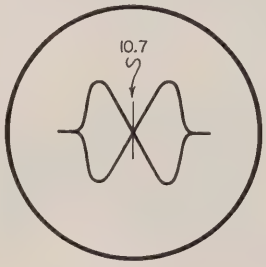
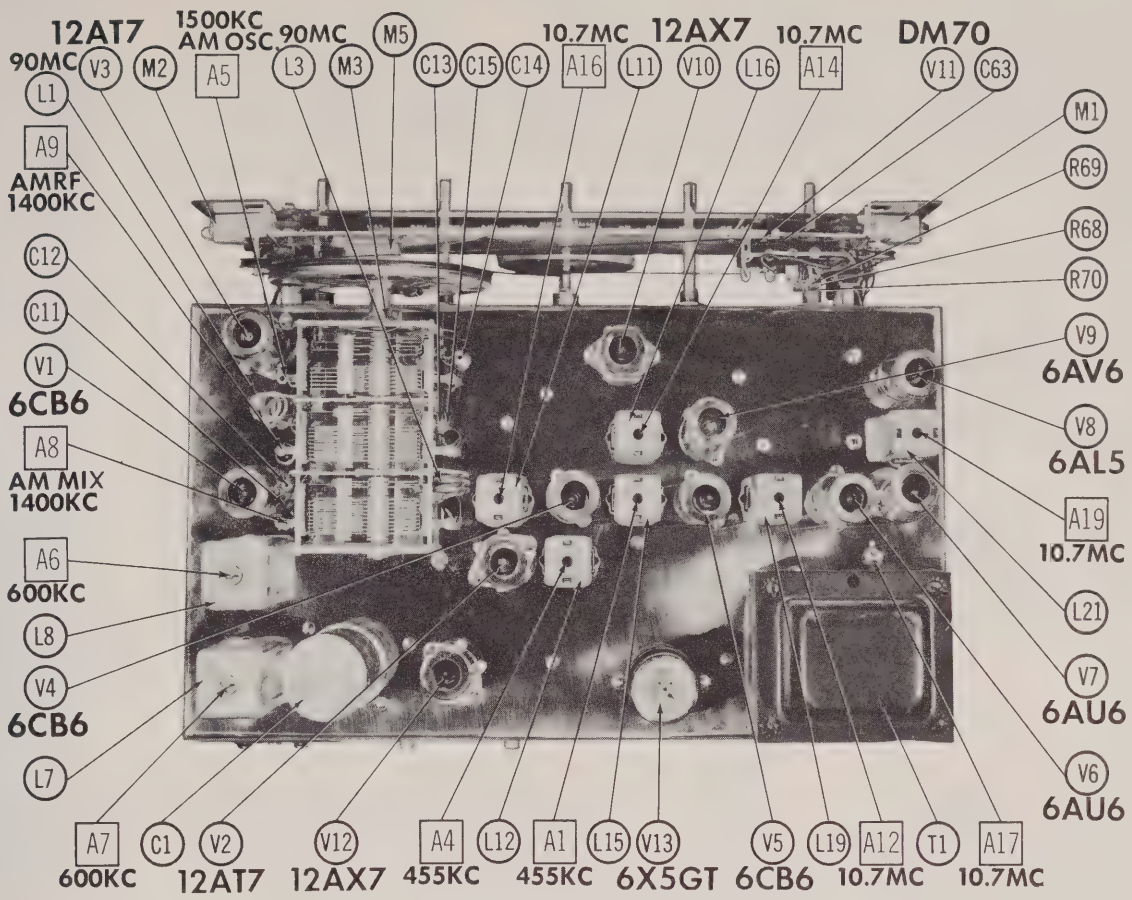
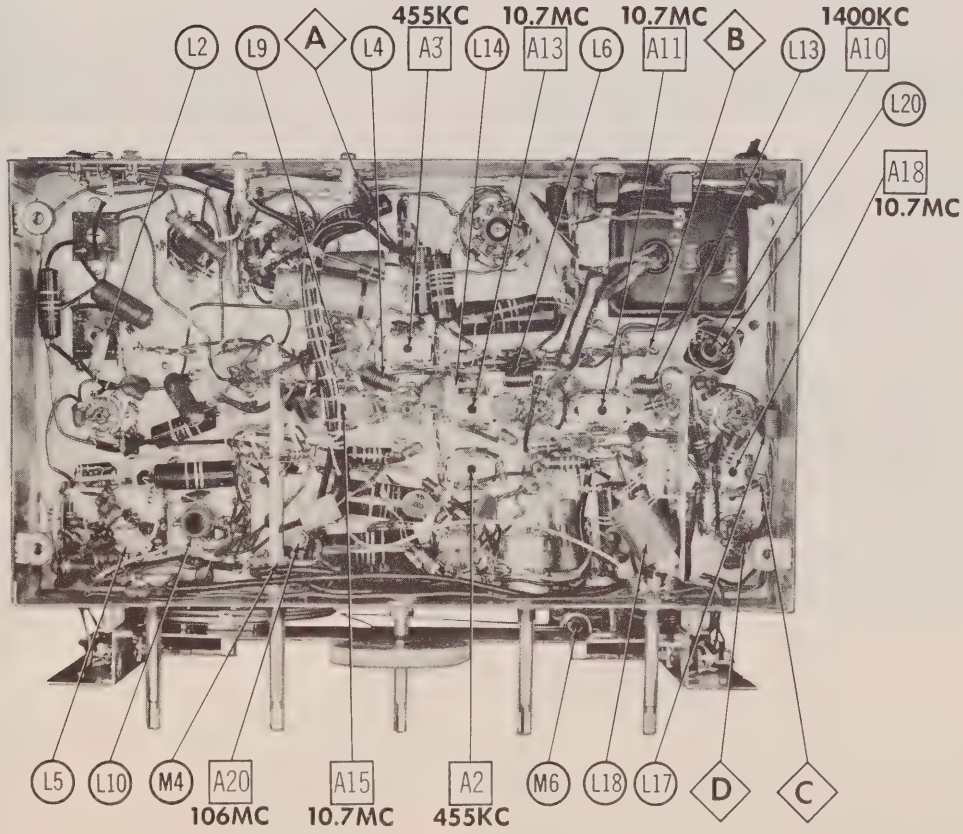


FIG. 2



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6CB6	
V2	FM Mixer-AM Mixer	12AT7	
V3	FM Osc. -AFC	12AT7	
V4	1st IF Amplifier	6CB6	
V5	2nd FM IF Amplifier	6CB6	
V6	1st FM Limiter	6AU6	
V7	2nd FM Limiter	6AU6	
V8	Discriminator	6AL5	
V9	AM Det-AVC-AF Amp.	6AV6	
V10	Cathode Follower	12AX7	
V11	Tuning Indicator	DM70	
V12	Phono Preamplifier	12AX7	
V13	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Craftsmen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300	CEX-1	AFH4-02-10	DO020	FP419.5	TMT-23	T-160	TVL-4580
B	■40	300			BR2035		TD-20-350	MT-4540	
C	20	300							
D	▲30	300							
C2	25	25		PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C3	10	250		PRS250V12	BR1225	TC52	TD-10-250	FM-2512	TVA-1504
C4	25	25		PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Craftsmen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	.022	400								
C6	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C7	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C8	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C9	.047	400								
C10	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C11	10			SI10	D6-100	TP09	GP1K-100	UC-531	5GA-Q1	
C12	6.8			NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCC-Q68	
C13	1.2									
C14	1-6		CKX-1		829-6		532-10			
C15	22			NP0-SI22	TCZ-22	TZ14	NP0K-220		5TCC-Q22	
C16	47			N750-SI47	TCN-47	TZ22	N750K-470	NT-5447	5TCU-Q47	
C17	22			NP0-SI22	TCZ-22	TZ14	NP0K-220		5TCC-Q22	
C18	2					Z005				
C19	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C20	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C21	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C22	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C23	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C24	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C25	.1	400								

PARTS LIST AND DESCRIPTIONS (Continued)
CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Craftsmen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C26	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C27	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C28	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C29	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C30	.022	400								
C31	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C32	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q10	
C33	15			NP0-DI15	TCZ-15	Z021	NP0-150		5TCC-Q15	
C34	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C35	56			NP0-SI56	TCZ-56	Z036	NP0-337-560			
C36	.022	400								
C37	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C38	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C39	.15	400								
C40	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C41	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C42	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C43	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C44	.047	400								Note 1
C45	200			SI200	D6-201	TP38	GP2K-201	UC-532	5GA-T2	
C46	1000			BPD-001	DD-102	K069	801-001	DC521	5GA-D1	
C47	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C48	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C49	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C50	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C51	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C52	1500			BPD-0015	DD-152	K071	801-0015	DC5215	5HK-D15	
C53	22			NP0-SI22	TCZ-22	TZ14	NP0K-220		5TCC-Q22	
C54	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C55	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C56	22			NP0-SI22	TCZ-22	TZ14	NP0K-220		5TCC-Q22	
C57	1500			BPD-0015	DD-152	K071	801-0015	DC5215	5HK-D15	
C58	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C59	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C60	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C61	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C62	470			1469-00047	D6-471	5R5T47	811-471		MS-347	
C63	.1	200	CZW104MD							
C64	750	500		1464-00075		1R5T75	811-751		MS-375	
C65	.1	400								
C66	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C67	.22	400								
C68	330	500		1469-00033	D6-331	5R5T33	811-331		MS-333	
C69	15			NP0-SI15	D6-150	TZ11	831-150		5TCC-Q15	
C70	.0033	400		1464-0033		1R5D33			MS-233	
C71	.0056	400		1464-0056		1R5D56			MS-256	
C72	.056	400								
C73	.1	400								
C74	15			NP0-SI15	D6-150	TZ11	831-150		5TCC-Q15	
C75	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Craftsmen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C76	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C77	.22	400								
C78	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C79	.0015	1000								
C80	3000	500		1464-003		1R5D3		MCB461	MS-23	
C81	.033	400								
C82	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C83	.01	400								
C84	1000			SH1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C85	.01	600								
C86	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	Note 2
C87	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	

Note 1: Some versions may use 4700MMF in this application.
Note 2: Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Craftsmen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	23S715	AB-60	A47-500K-Z	Q13-133	U48	Bass - Note 1
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	500K	½	23S727			Q13-133	UF55A	Volume (Panel) - Note 2
B	500K	½	Not Req.			B11-133	UR55L	Volume (Rear)
C	Shaft		Not Req.			Not Req.	DS-36	Attach to R2A
D	Switch		Not Req.			76-1	US-26	Attach to R2B
R3A	500K	½	23S715	AB-60	A47-500K-Z	Q13-133	U48	Treble - Note 3
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A

Note 1: Some versions may use an alternate control part no. 26S028 in this application.
Note 2: Some versions may use an alternate control part no. 26S017 in this application.
Note 3: Some versions may use an alternate control part no. 23S016 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Craftsmen PART No.	IRC PART No.	NOTES
R4	470K			BTS-470K	
R5	1Meg			BTS-1Meg	
R6	100K			BTS-100K	
R7	220K			BTS-220K	
R8	1500Ω			BTS-1500	
R9	100K			BTS-100K	
R10	1000Ω			BTS-1000	
R11	330Ω			BTS-330	
R12	6.8Ω				
R13	33K			BTS-33K	
R14	1000Ω			BTS-1000	
R15	220Ω			BTS-220	
R16	100K			BTS-100K	
R17	1Meg			BTS-1Meg	
R18	10K	1		BTA-10K	
R19	47K	1		BTA-47K	
R20	330Ω			BTS-330	
R21	220K			BTS-220K	
R22	2200Ω			BTS-2200	
R23	2200Ω			BTS-2200	
R24	2.2Meg			BTS-2.2Meg	
R25	2.2Meg			BTS-2.2Meg	
R26	100K			BTS-100K	
R27	1Meg			BTS-1Meg	
R28	68K			BTS-68K	
R29	220K			BTS-220K	
R30	1000Ω			BTS-1000	
R31	220Ω			BTS-220	
R32	68K			BTS-68K	
R33	12K			BTS-12K	
R34	1000Ω			BTS-1000	
R35	150Ω			BTS-150	
R36	220Ω			BTS-220	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Craftsmen PART No.	IRC PART No.	NOTES
R37	150Ω			BTS-150	
R38	1Meg			BTS-1Meg	
R39	1Meg			BTS-1Meg	
R40	15K			BTS-15K	
R41	4700Ω			BTS-4700	
R42	1500Ω			BTS-1500	
R43	22K	1		BTA-22K	
R44	150Ω			BTS-150	
R45	150K			BTS-150K	
R46	47K	1		BTA-47K	
R47	100K			BTS-100K	
R48	100K			BTS-100K	
R49	150K			BTS-150K	
R50	120K			BTS-120K	
R51	120K			BTS-120K	
R52	1Meg			BTS-1Meg	
R53	2.2Meg			BTS-2.2Meg	
R54	220K			BTS-220K	
R55	470K			BTS-470K	
R56	470K			BTS-470K	
R57	470Ω 5%			BW½-470 5%	
R58	22K			BTS-22K	
R59	47K			BTS-47K	
R60	4700Ω			BTS-4700	
R61	47K 5%			BTS-47K 5%	
R62	180K	1		BTA-180K	
R63	1500Ω			BTS-1500	
R64	470K			BTS-470K	
R65	470Ω			BW½-470	
R66	22K			BTS-22K	
R67	1Meg			BTS-1Meg	
R68	820K			BTS-820K	
R69	220K			BTS-220K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Craftsmen PART No.	IRC PART No.	NOTES
R70	200Ω 5%			BTS-200 5%	
R71	22K			BTS-22K	
R72	22K			BTS-22K	
R73	10K			BTS-10K	
R74	220K	1		BTA-220	
R75	2700Ω 5%		RFE272JA	MBC-2700 5%	Note 1
R76	100K 5%			BTS-100K 5%	
R77	3.3Meg 5%			BTS-3.3Meg 5%	
R78	680K 5%			BTS-680K 5%	
R79	2.2Meg 5%			BTS-2.2Meg 5%	
R80	1Meg			BTS-1Meg	
R81	100K			BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Craftsmen PART No.	IRC PART No.	NOTES
R82	1800Ω			BTS-1800	
R83	10Meg			BTS-10Meg	
R84	10K			BTS-10K	
R85	82K 5%			BTS-82K 5%	
R86	120K 5%			BTS-120K 5%	
R87	1500Ω	10		PW10-1500	
R88	100K			BTS-100K	
R89	15K			BTS-15K	
R90	2200Ω	2		BTB-2200	
R91	220Ω	2		BW2-220	
R92	.47Ω	5	RZK47:KE		

Note 1: Special type resistor.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Craftsmen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .45A	430VCT @ .053A	6.3VCT @ 1.39A	6.3VAC @ 2.85A	52S011					

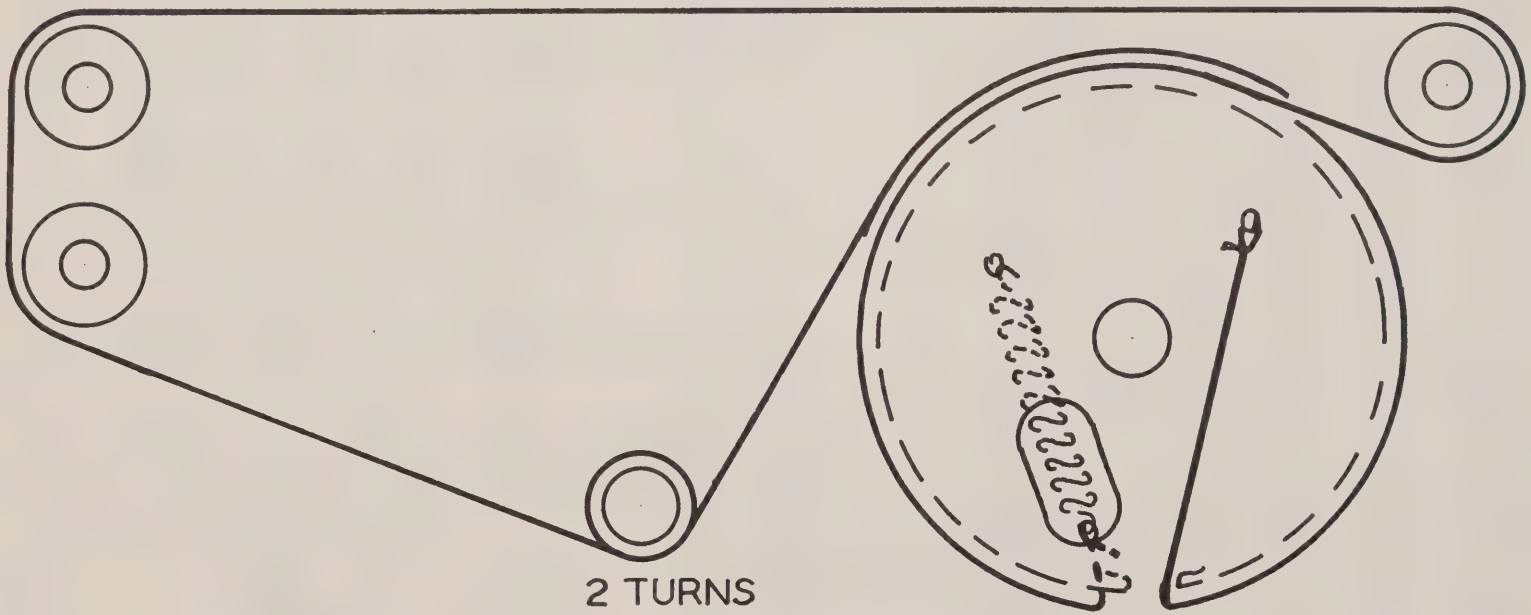
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Craftsmen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω		53A026				Tapped
L2	RF Choke	3Ω		53A046				3.3 Microhenries; IRC part #CLA
L3	FM RF Coil	0Ω		51A001				
L4	Fil. Choke	0Ω		53X501	19-1000		4602	1 Microhenry
L5	FM Osc. Coil	0Ω	0Ω	53A025				
L6	Fil. Choke	0Ω		53X501	19-1000		4602	1 Microhenry
L7	AM Ant. Coil	0Ω*	4.8Ω	53A031				*Tapped
L8	AM RF Coil	90Ω	5.2Ω	51A003				
L9	Cathode Choke	2.5Ω		T-18	19-7100		6112	100 Microhenries
L10	AM Osc. Coil	1.4Ω	9Ω■	53A029				■ Tapped @ 1.3Ω
L11	1st FM IF	.6Ω	.9Ω	50X024				
L12	1st AM IF	8.5Ω	18Ω	53X004				
L13	Fil. Choke	0Ω		53X501	19-1000		4602	1 Microhenry
L14	RF Choke	3Ω		53A046				3.3 Microhenries; IRC part #CLA
L15	2nd FM IF	1Ω	1Ω	50X025	16-3487	FM-254	1463	
L16	2nd AM IF	18Ω	18Ω	50X011	16-6770	BC-355	12-C6	
L17	Fil. Choke	0Ω		53X501	19-1000		4602	1 Microhenry
L18	10KC Filter	1.6K		56S004				
L19	3rd FM IF	1Ω	1Ω	50X025	16-3487	FM-254	1463	
L20	FM Limiter	.5Ω		53A005				
L21	Discriminator	.8Ω	.9ΩCT	50X003	17-3494	FM-253	1464	

MISCELLANEOUS

ITEM No.	PART NAME	Craftsmen PART No.	NOTES
M1	Dial Light		#44
M2	Dial Light		#44
M3	Tuning Cap.	CAX-1	6 Gang (AM Sections: 25-430MMF, 23-430MMF, 24-195MMF)
M4	Switch	SW-35	Selector & Phono Compensation (Rotary, Wafer Type)
M5	Neon Light		FM IF
M6	Neon Light		AM IF
A10	Trimmer Cap.	CVX-1	10KC Filter (10-160MMF)
	Knob	15A027	Bass, Treble & On-Off-Volume
	Knob	15A028	Tuning
	Knob	N-9	Selector
	Dial Pointer	82A002	
	Dial Glass	1N-61	

TUNING GANG FULLY CLOSED

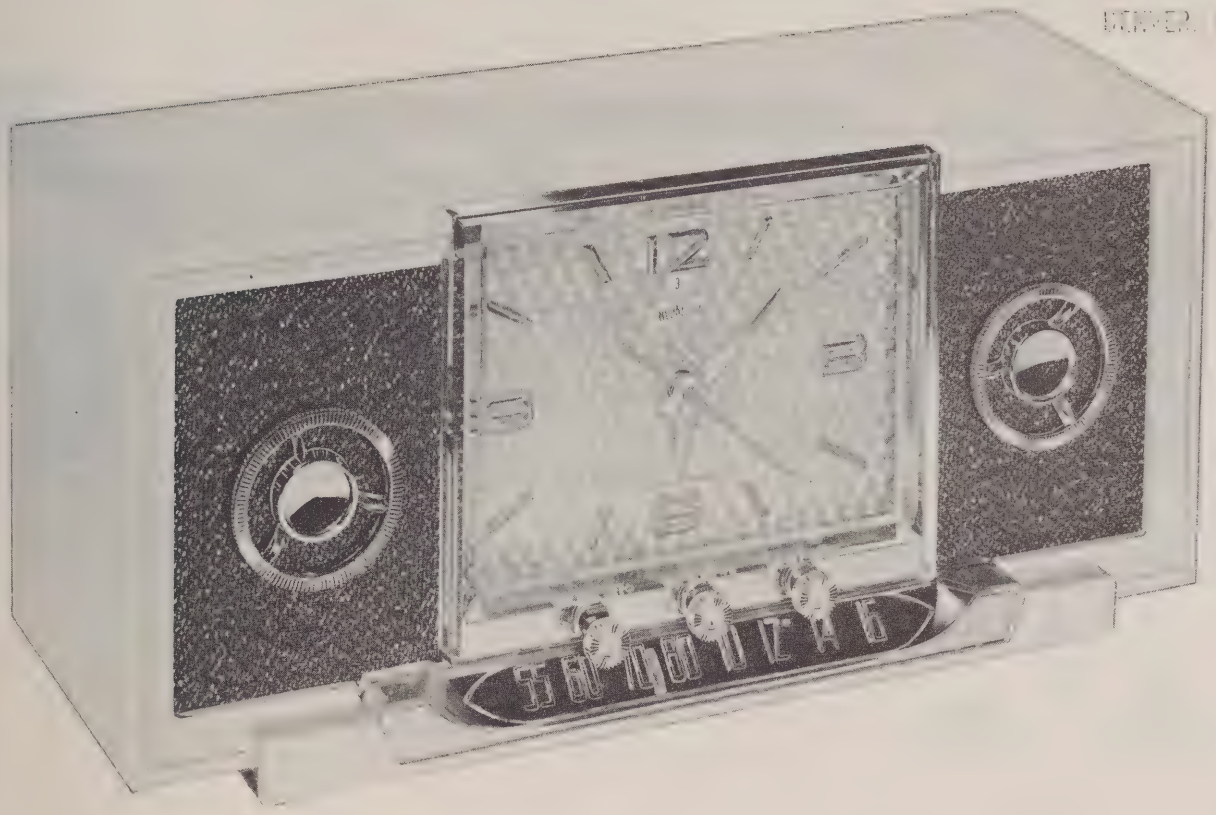


DIAL CORD DRIVE

FIRESTONE MODEL 4-A-162 (Code 382-6-378/2)

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST.
DENVER, COLO. 80211

FIRESTONE MODEL 4-A-162 (Code 382-6-378/2)



FIRESTONE MODEL 4-A-162 (Code 382-6-378/2)

TRADE NAME	Firestone Model 4-A-162 (Code 382-6-378/2)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles
RATING	.26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400∿Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1000KC	1000KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

FIRESTONE MODEL 4-A-162

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	
V4	Audio Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	42586	PRS150V3050	BBRD5315	TCD497	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C3	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C4A	220									
B	2000									
C	5000		♦ 41696	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C5	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C6	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C8	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

♦ Items C4A, C4B, C4C, C4D, C4E, R4A, R4B and R4C are combined in one unit. When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	42429	B-60	A47-500K-Z FS-3	Q13-133	U-48	Volume Attach to R1A
B	Shaft							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K			BTS-22K	
R3	2.2Meg			BTS-2.2Meg	
R4A	6.8Meg			BTS-6.8Meg	
B	470K		♦41696	BTS-470K	
C	470K			BTS-470K	

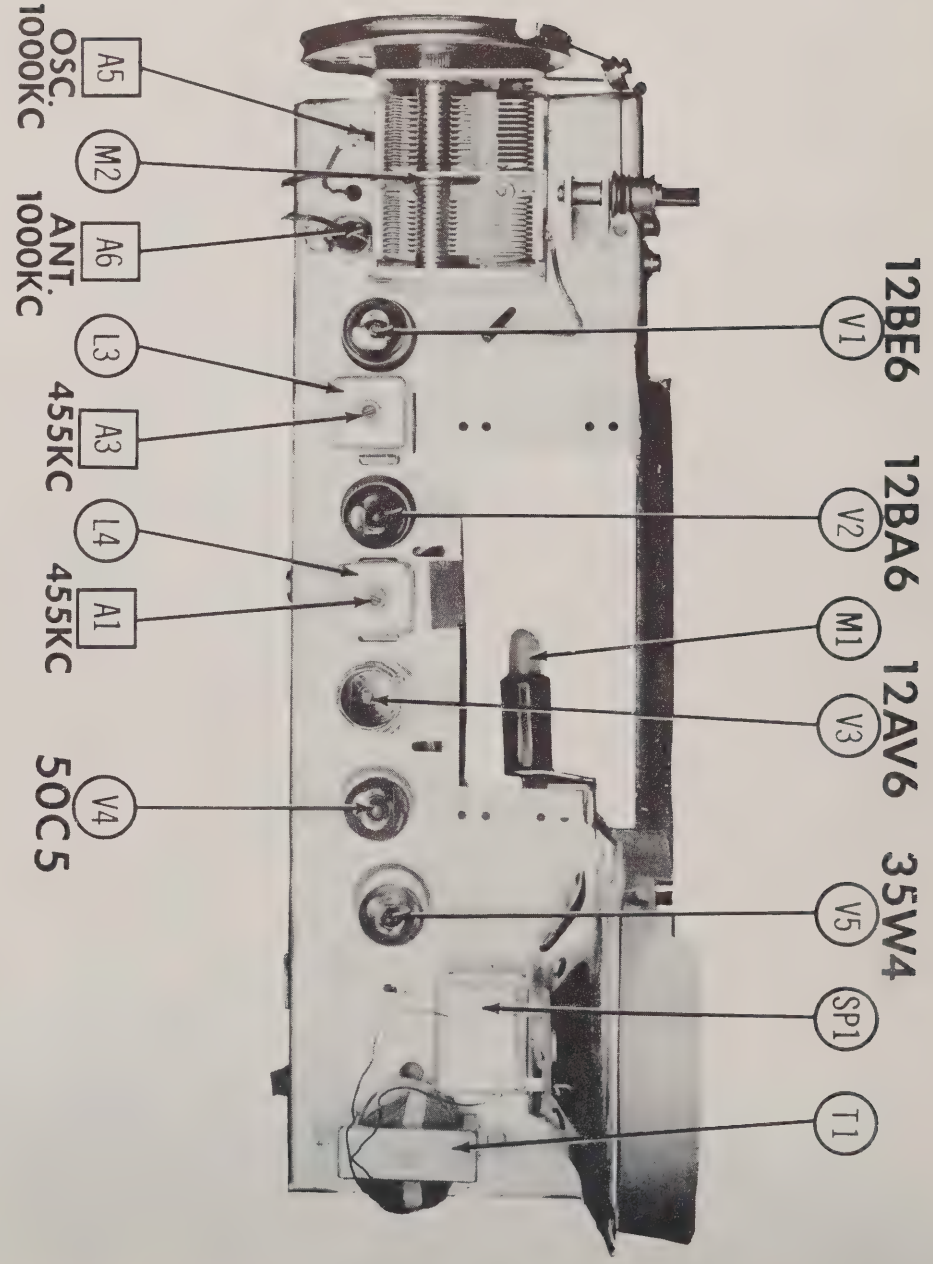
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R5	100K			BTS-100K	
R6	120Ω			BTS-120	
R7	1200Ω	1		BTA-1200	
R8	47Ω	1	19171		
R9	330K			BTS-330K	

♦ Items R4A, R4B, R4C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2300Ω	3.3Ω	42700-1	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.3Ω	22875	4A07	223S1	

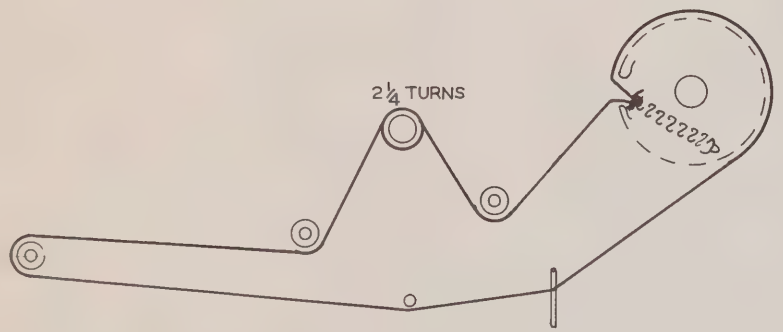
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.5Ω		42680-1				Includes cabinet back
L2	Osc. Coil	.7Ω	6.8Ω	25192-1	14-1073 *		69-OSC.	
L3	Input IF	15Ω	15Ω	40845-1	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	40845-1	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.

MISCELLANEOUS

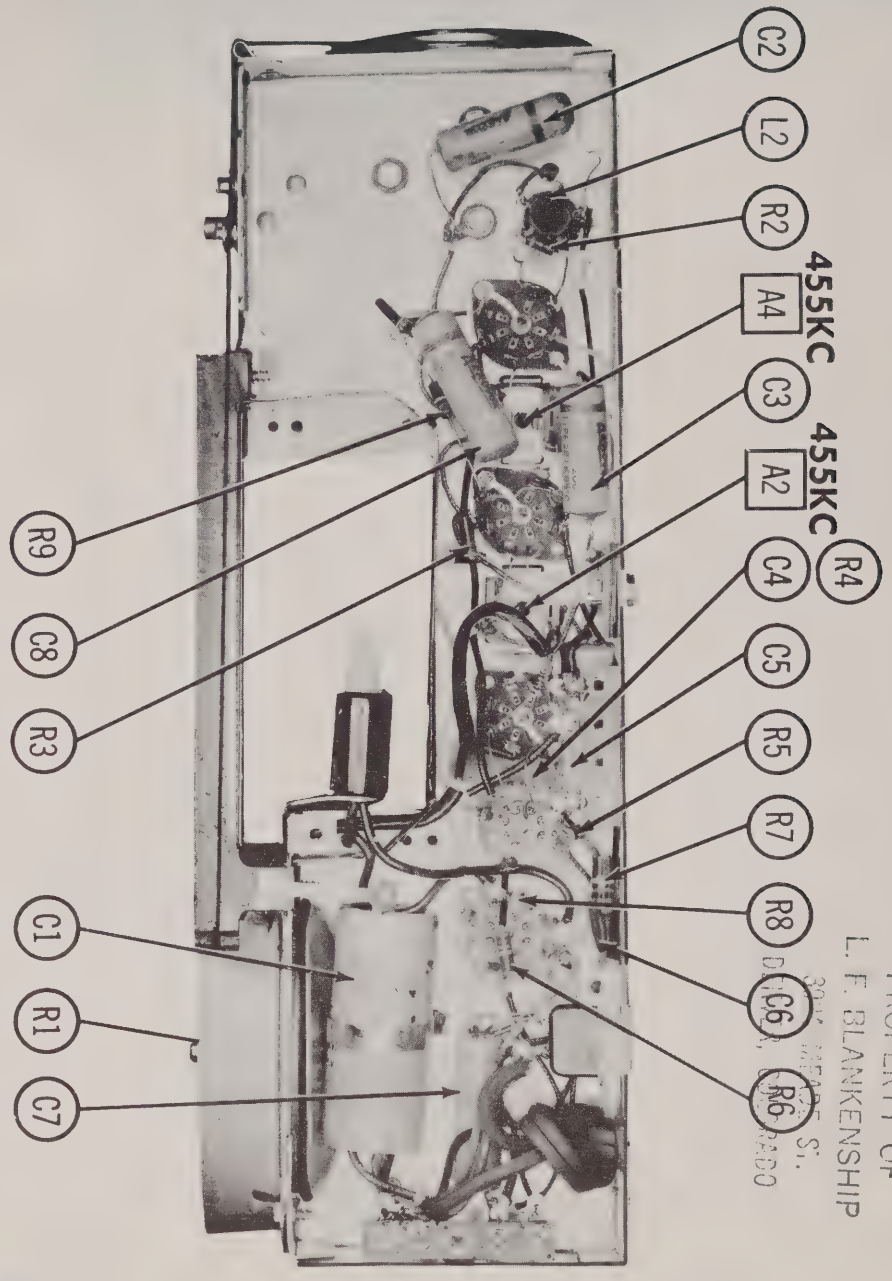
ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	Dial Light	23849	#47
M2	Tuning Cap.	42428	2 Gang (35-370MMF, 28-175MMF)
	Cabinet	44119-1	Ivory
	Cabinet	44119-3	Sandalwood
	Knob	42413	Volume & tuning
	Knob	42414	Clock (3 used)
	Pointer	42426	
	Crystal	43411	Clock
	Crystal	43412	Radio Dial



TUNING GANG FULLY CLOSED

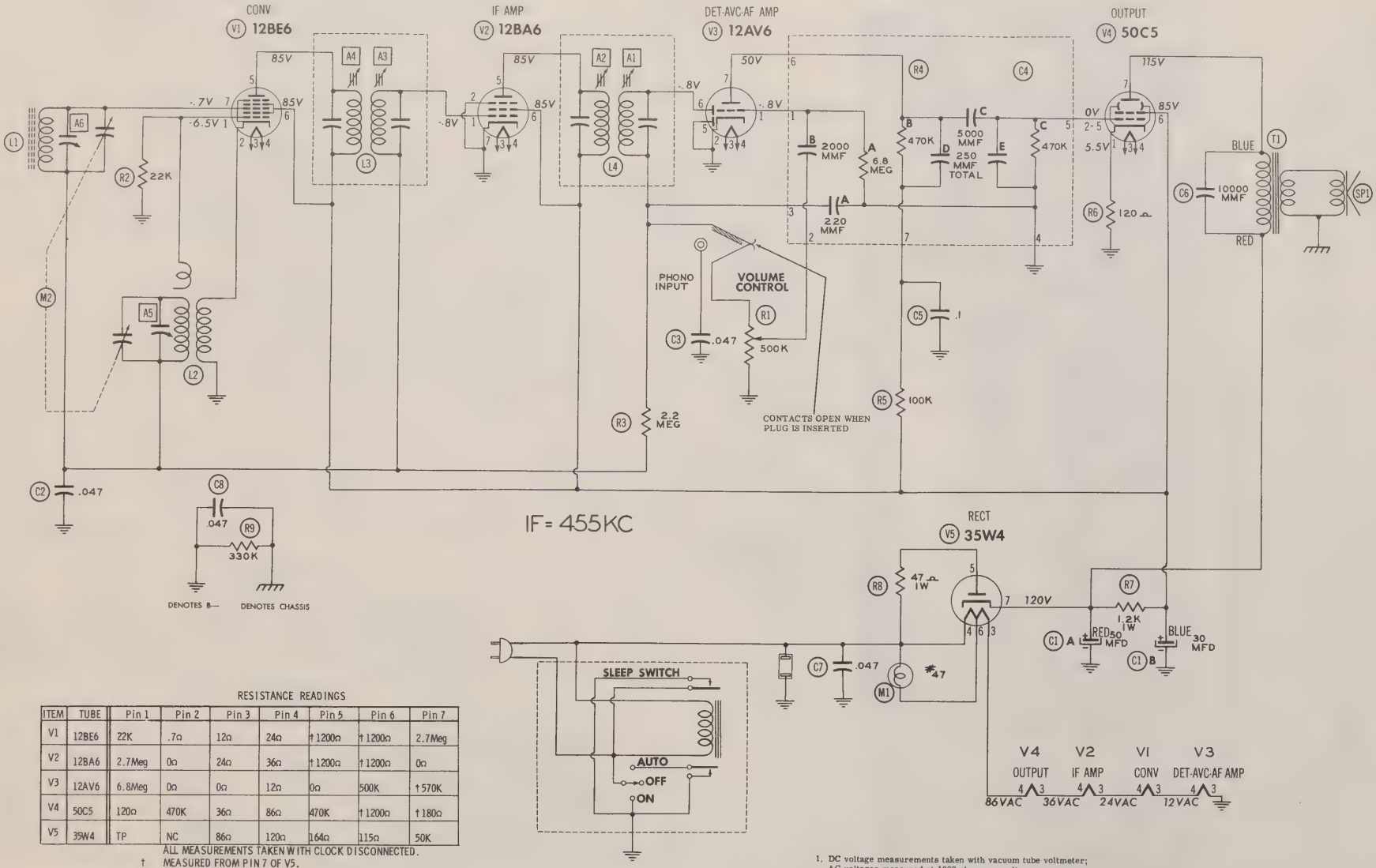
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP

FIRESTONE MODEL 4-A-162



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	12Ω	24Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	500K	†570K
V4	50C5	120Ω	470K	36Ω	86Ω	470K	†1200Ω	†180Ω
V5	35W4	TP	NC	86Ω	120Ω	164Ω	115Ω	50K

ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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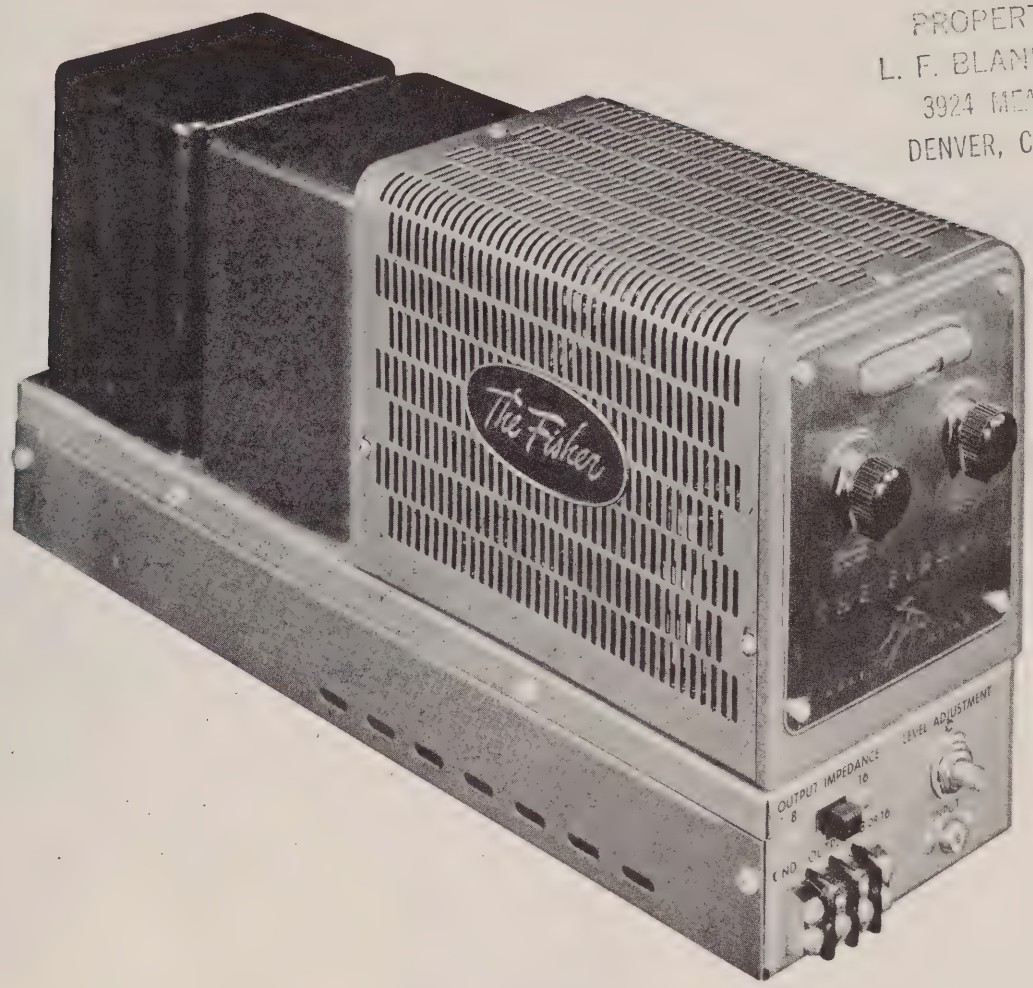
FISHER
MODEL 80-AZ

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

FISHER
MODEL 80-AZ



FISHER
MODEL 80-AZ

TRADE NAME	Fisher Model 80-AZ
MANUFACTURER	Fisher Radio Corp., 21-21 44th. Drive, Long Island City 1, N.Y.
TYPE SET	AC Operated 30 Watt Audio Amplifier
TUBES (Five)	Types 12AT7 AF Amp.-Phase Inv., 12AU7A Driver, (2) EL-37 Output, 5V4G Rectifier
POWER SUPPLY	105-125 Volts AC-50/60 Cycles RATING 1 Amp. @ 117 Volts AC

PHASE INVERTER BALANCE ADJUSTMENT

1. Disconnect the speaker and connect a 16 ohm, 20 watt resistor to "GND" and "8 or 16".
2. Connect the audio generator to the amplifier input.
3. Switch IMPEDANCE SELECTOR to "16".
4. Turn Z-Matic control fully counter clockwise.
5. Connect the wave analyzer or distortion analyzer across the 16 ohm resistor.
6. Set the audio generator to 1000 cycles and adjust the attenuator so that the amplifier produces 20 watts (17.85 volts RMS) across the 16 ohm resistor.
7. Tune the wave analyzer to the second harmonic of 1000 cycles or, if a distortion analyzer is used, tune it for minimum reading at 1000 cycles.
8. Adjust the phase inverter balance control (R4) for minimum distortion.

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PARTS LIST AND DESCRIPTIONS

FISHER MODEL 80-AZ

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp.-Phase Inv.	12AT7	
V2	Driver	12AU7A	
V3	Output	EL-37	
V4	Output	EL-37	
V5	Rectifier	5V4G	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	500	C-522-114	AFH2-72	B0530	FP288	TMD-62	D-275	TVL-2940
B	▲40	500							
C2A	▲40	450	C-1798	AFH2-57	B0450	FP238	TMD-54	D-235	TVL-2764
B	▲40	450							
C3	50	50	C-508-115	PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.22	200	C69P224V2	P288N-22		CUB2P22		PT4022	2TM-P22	
C5	220		CC-21GP221K5	NP0-SI220	D6-221	22R5T22	811-221		5TCC-T22	
C6	.022	400	68P223M4	P488N-Q22		CUB4S22	817-02	PT4122	4TM-S22	
C7	.022	400	68P223M4	P488N-022		CUB4S22	817-02	PT4122	4TM-S22	
C8	.1	400	68P104M4	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C9	.1	400	68P104M4	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C10	5000		C-508-122	DI-005	DD-502	K080	811-005	DC-525	5GA-D5	
C11	.047	600	C-68P473M6	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C12	82			1469-000082	D6-820	TZ28	801-820		MS-482	Note 1
C13	420									Note 1
C14	.01	600	C-2747	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	

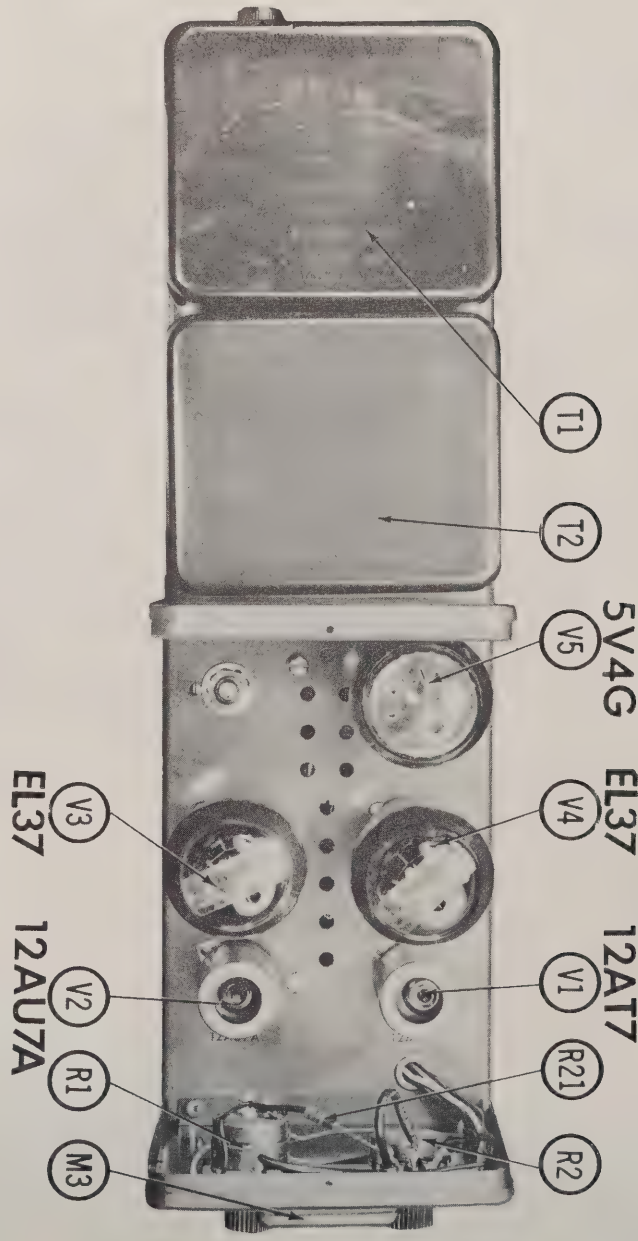
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1000Ω	½	R557-126	AB-5	A47-1000-S	Q11-108	U4	Z-Matic
B	Shaft		Not Req.	AK-8	RS-3/16	NQ	DS-37	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A
R2A	100K	½	R557-121				U40	Peak Power
B	Shaft		Not Req.				DS-37	Attach to R2A
R3A	500K	½	R-2815-9	AB-59	A47-500K-S	Q11-133	SU-50	Level
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R3A
R4A	50K	½	R-50000-5	AB-31	A47-50K-S	Q11-123	SU-35	Balance
B	Shaft		Not Req.	AK-1	FKS-1/4	RQ	Not Req.	Attach to R4A
R5	35K	½						Peak Power Indicator Note 1.

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FISHER PART No.	IRC PART No.	
R6	1500Ω		RC-20BF152K	BTS-1500	
R7	220K		RC-20BF224K	BTS-220K	
R8	10K		RC-20BF103K	BTS-10K	
R9	100K		RC-20BF104K	BTS-100K	
R10	68K		RC-20BF683K	BTS-68K	
R11	470K		RC-20BF474K	BTS-470K	
R12	470K		RC-20BF474K	BTS-470K	
R13	150K		RC-20BF154K	BTS-150K	
R14	150K		RC-20BF154K	BTS-150K	
R15	4700Ω		RC-20BF472K	BTS-4700	
R16	470K		RC-20BF474K	BTS-470K	
R17	470K		RC-20BF474K	BTS-470K	
R18	68Ω			BTS-68	Note 1
R19	68Ω			BTS-68	Note 1

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FISHER PART No.	IRC PART No.	
R20	100K		RC-20BF104K	BTS-100K	
R21	6800Ω		RC-20BF682K	BTS-6800	
R22A	350Ω				
B	1Ω	10	R-557-128		
C	1Ω				
D	100Ω	5			
R23	820K		RC-20BF824K	BTS-820K	
R24	2.2Meg			BTS-2.2Meg	Note 1
R25	18K		RC-20BF183K	BTS-18K	Note 1
R26	2200Ω		RC-20BF222K	BTS-2200	
R27	330Ω		RC-20BF331K	BTS-330	
R28	2200Ω		RC-20BF222K	BTS-2200	
R29	10K		RC-20BF103K	BTS-10K	
R30	10K		RC-20BF103K	BTS-10K	

Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	FISHER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1A	800VCT @.110ADC	6.3VCT @3.2A		T-557-123					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.1	SEC.	FISHER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4300Ω CT	16Ω tap @	T-557-122						
	PRI. 2	.94Ω							
	280Ω CT								

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FISHER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V			312003. (3AG 3A)	342001	AGC 3	HKP

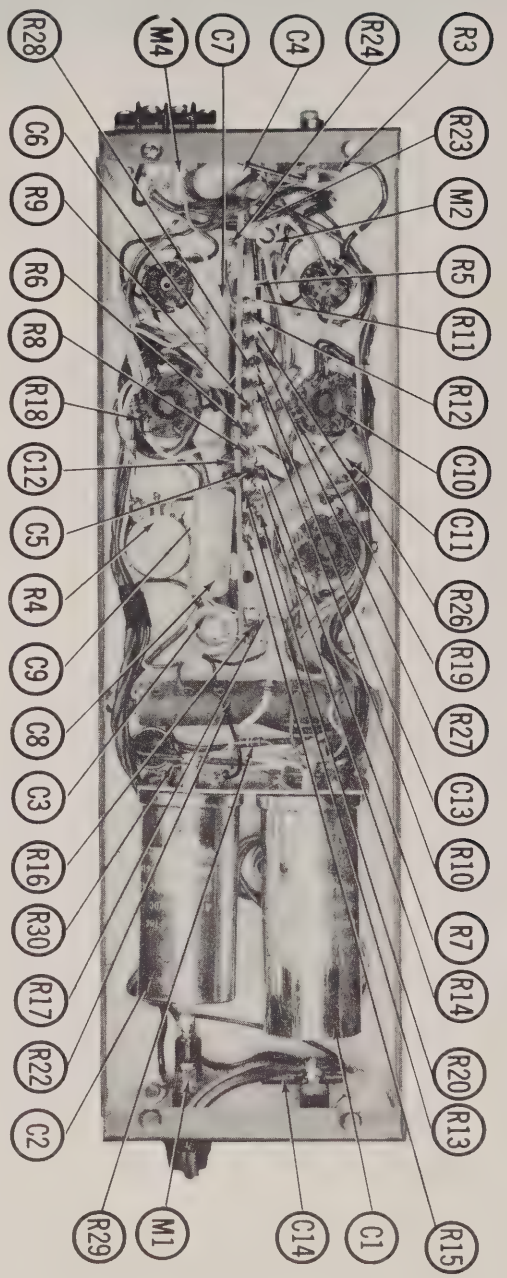
MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M2	Neon Bulb	V-NE-51	#NE51. Voltage Regulator
M3	Neon Bulb	I-557-120	Power Indicator
M4	Switch	S-505-117	Output Impedance Selector (DPDT-Slide Type)

SET 342 FOLDER 6

FISHER MODEL 80-AZ

CHASSIS—BOTTOM VIEW



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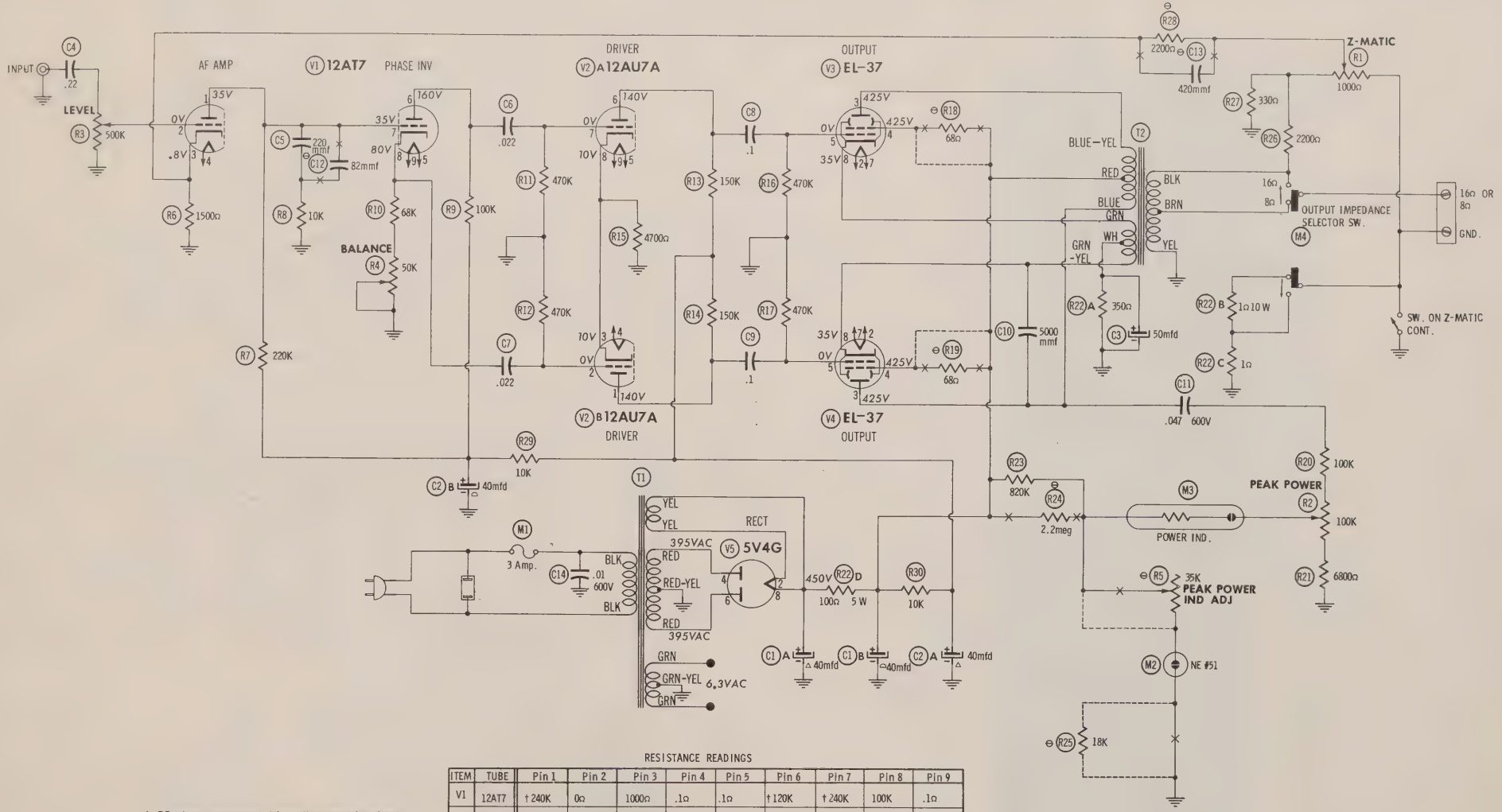
FISHER MODEL 80-AZ



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†240K	0Ω	1000Ω	.1Ω	.1Ω	†120K	†240K	100K	.1Ω
V2	12AU7A	†160K	470K	4700Ω	.1Ω	.1Ω	†160K	470K	4700Ω	.1Ω
V3	EL-37	NC	.1Ω	230Ω	170Ω	470K	TP	.1Ω	370Ω	
V4	EL-37	NC	.1Ω	220Ω	170Ω	470K	TP	.1Ω	370Ω	
V5	5V4G	NC	33K	NC	95Ω	NC	90Ω	NC	33K	

† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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PHOTOFACT* Folder

*TRADE MARK

GENERAL ELECTRIC
MODELS 17T025, 17T026 ("MM" Line)

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PROPERTY OF

GENERAL ELECTRIC MODEL 17T025

TRADE NAME	General Electric Models 17T025, 17T026 ("MM" Line))
MANUFACTURER	General Electric Co., Appliance & Television Div., Electronics Park, Syracuse, N.Y.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.22 Amp. @117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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GENERAL ELECTRIC
MODELS 17T025, 17T026 ("MM" Line)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 2 metal screws. Remove rear cover.

3. Remove 2 metal screws holding chassis to cabinet bottom and 1 metal screw from top center of cabinet. (Just above yoke).

4. Disconnect speaker leads. Remove 2 speaker nuts. Remove speaker.

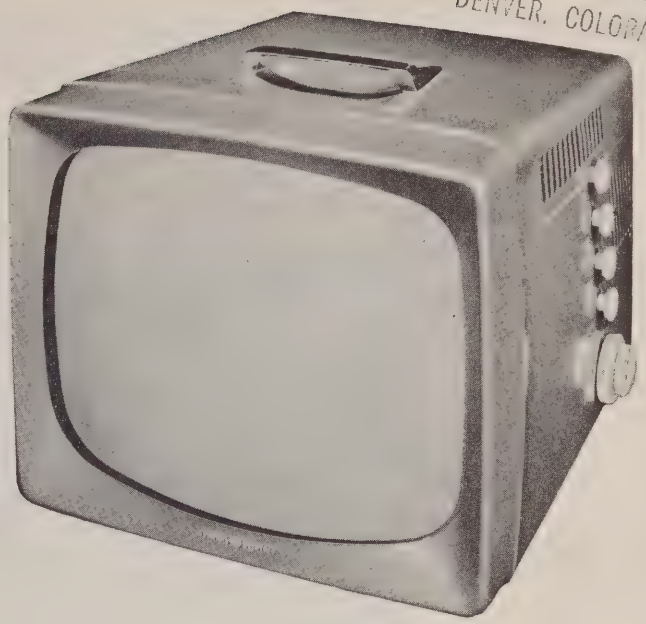
5. Remove picture tube socket, ion trap, centering magnet and yoke clamp.

6. Remove or lower adjustable foot at the bottom rear of cabinet.

7. Remove chassis by grasping the tuner and HV cage and tilt the top forward, at the same time pull the HV cage to the rear.

8. Slip the chassis past the yoke keeping tuner shaft in cabinet hole. The right side of chassis should clear cabinet rear so HV lead can be removed.

9. Chassis may now slid from cabinet right side first.



MODEL
17T025

GENERAL ELECTRIC
MODELS 17T025, 17T026 ("MM" Line)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from bottom front of cabinet (holding bezel to cabinet). Remove bezel and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 4.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set horizontal hold to center of rotation. Adjust horizontal stabilizer coil (L28) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the ratio detector secondary (A10) located on top of chassis.

FUSES

One fuse is used for L. V. power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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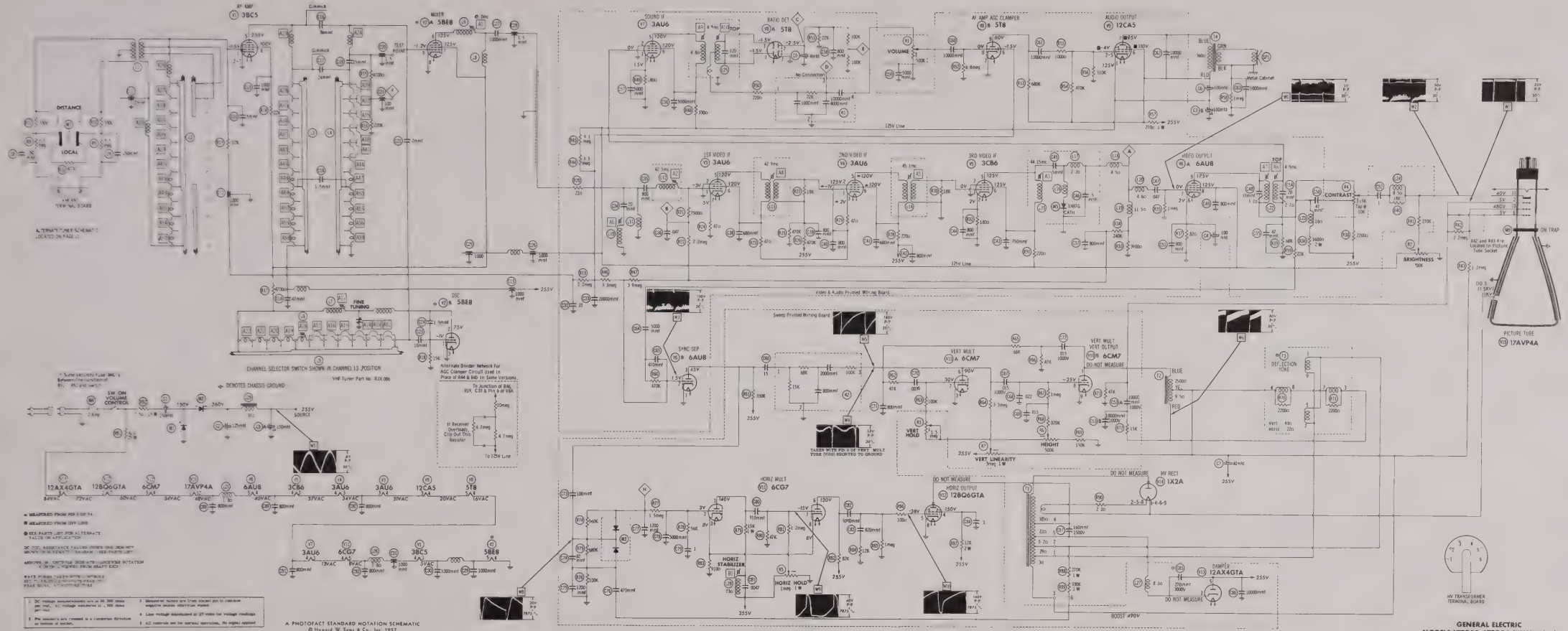
GENERAL ELECTRIC
MODELS 17T02, 17T026 ("MM" Line)
GENERAL ELECTRIC
MODELS 17T025, 17T026 ("MM" Line)
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CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part No. R2X 086
DENOTES CHASSIS GROUND
12AX4GTA 12BQ6GTA 6CM7 17AVP4A 6AU8 3CB6 3AU6 3AU6 12CA5 5T8
3AU6 6CG7 3BC5 5BE8
PICTURE TUBE
V18 17AVP4A

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CHASSIS TOP VIEW

GENERAL ELECTRIC
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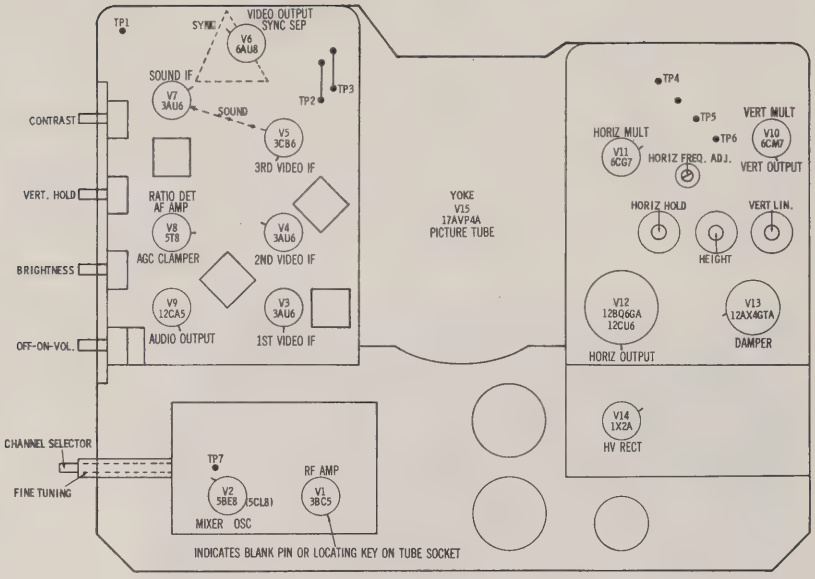
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

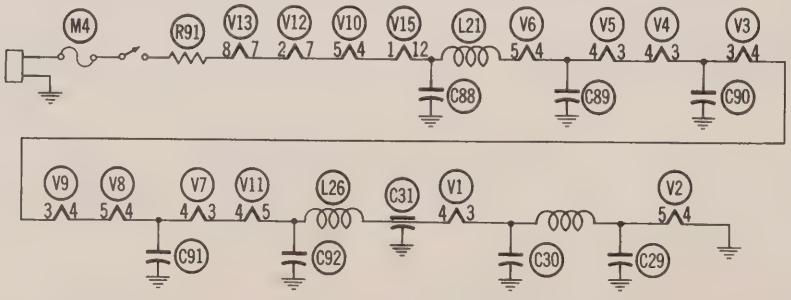
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2), Fuse (M4)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V6, V10**
No horiz. sync - **V6, V11**
No vert. or horiz. sync - **V11**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. - **V6, V10**
Horiz. off freq. - **V6, V11**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative (See circuit below).



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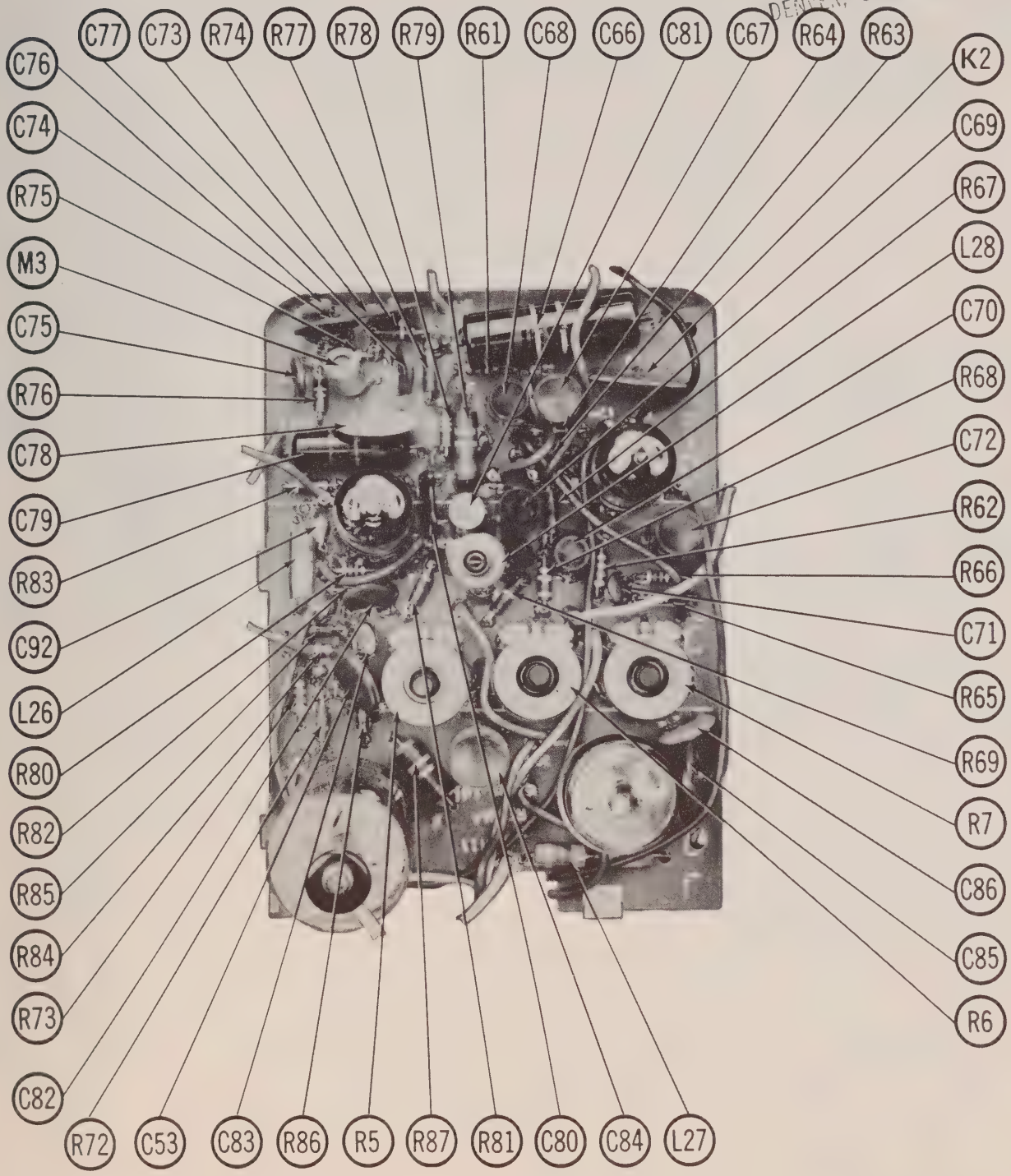


HORIZONTAL & VERTICAL SWEEP PRINTED CIRCUIT

SET 342 FOLDER 7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS - READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
The high voltage shock hazard may be eliminated by connecting the negative lead of 45 volt battery to pin 5 of 12BQ6GTA (V12). Positive side to chassis.
Allow a 30 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Turn the volume control fully counter clockwise. Turn the contrast control fully clockwise. Connect the negative lead of a 3 volt battery to point B. Connect the positive lead to chassis.
Calibrate the scope so that 3 volts peak to peak produced two inch vertical deflection.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
NOTE: It is not necessary to perform steps 1 thru 4 unless adjustments A1 thru A5 are far from their proper frequencies. For proper overall desired response, step 6 is necessary.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to un-grounded tube shield (floating vertical converter tube (V3). Low side to chassis. Use very short shielded leads.	Not Used	45.0MC unmod	Any non-interfering channel.	Use VTVM DC probe thru 10K to point (A). Common to chassis.	A1	Use only enough generator output for usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	"	42.5MC	"	"	A2	"
3.	"	"	"	44.1MC	"	"	A3	"
4.	"	"	"	42.8MC	"	"	A4	"
5.	"	"	"	45.4MC	"	"	A5	"
6.	"	"	44MC (10MC Swp)	41.25MC 42.5MC 45.0MC 45.75MC	"	Vert. amp thru 10K to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust A1 thru A6 for response similar to Fig. 1. Adjust A4 to place 42.5MC marker on low frequency side. Adjust A3 to place 45.75MC marker on high frequency side. Adjust A2, A3 and A4 to shape peak region of curve. The 41.25MC sound marker should not be above 9% on response curve. Adjust A6 to place 47.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

Set contrast control to maximum.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to point (A). Low side to chassis.	Not Used	4.5MC (400% AM)	Any	Vert. amp thru detector probe to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Adjust for MINIMUM indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	Direct	High side to point (A). Low side to chassis.	4.5MC (unmod)	Any non-interfering channel.	DC probe to point (D). Common to chassis.	A8, A9	Adjust for maximum deflection on VTVM.
9.	"	"	"	"	DC probe to point (C) to point (D). Common to point (A).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel.	Vert. amp. to point (E). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor (C8). Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	"	"	"	"	Vert. amp. to point (D). Low side to chassis.	A10	Reconnect C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A8 for maximum amplitude and symmetry of crossover lines.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Follow steps 8 and 9 using station audio instead of 4.5MC signal generator frequency. Connect VTVM in the same procedure.

FIG. 7

FIG. 8

FIG 9

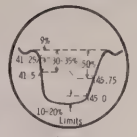
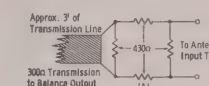
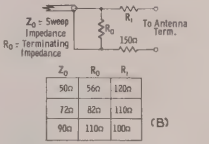


FIG. 1

FIG. 2

FIG. 3





Z_0	R_0	R_1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
90Ω	110Ω	100Ω

(B)

FIG. 4

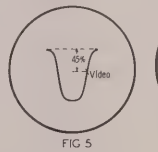


FIG. 5

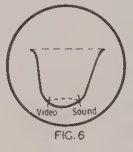


FIG. 6

VHF OSCILLATOR ALIGNMENT FOR VHF TUNER RJX-088

Connect bias as under "Video IF Alignment".
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1). Set the fine tuning knob 2/3 turn from maximum counter clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer (L1).	215MC (10-15MC Swp)	210.25MC	13	Vert. amp thru 10K to point (A). Low side to chassis.	A11	Adjust so that video marker falls at 49% on response curve as in Fig. 5.
11.	"	"	207MC (10-15MC Swp)	205.25MC	12	"	A12	"
12.	"	"	201MC (10-15MC Swp)	199.25MC	11	"	A13	"
13.	"	"	195MC (10-15MC Swp)	193.25MC	10	"	A14	"
14.	"	"	189MC (10-15MC Swp)	187.25MC	9	"	A15	"
15.	"	"	183MC (10-15MC Swp)	181.25MC	8	"	A16	"
16.	"	"	177MC (10-15MC Swp)	175.25MC	7	"	A17	"
17.	"	"	85MC (80-15MC Swp)	83.25MC	6	"	A18	"
18.	"	"	79MC (70-15MC Swp)	77.25MC	5	"	A19	"
19.	"	"	89MC (80-15MC Swp)	87.25MC	4	"	A20	"
20.	"	"	83MC (80-15MC Swp)	81.25MC	3	"	A21	"
21.	"	"	57MC (50-15MC Swp)	55.25MC	2	"	A22	"

VHF RF AND MIXER ALIGNMENT FOR VHF TUNER RJX-088

When checking response, tuner shield cover should be in place.
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer (L1).	215MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp thru 10K to point (A). Low side to chassis.	A23, A24, A25, A26	Adjust A25 and A26 for maximum amplitude and symmetry with markers placed as in Fig. 6. Adjust A25 and A26 for maximum gain. A23 affects the sound side of curve. A24 affects the video side.
23.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A27, A28, A29	Adjust for curve similar to Fig. 6. Adjusted in numerical order, the bandwidth is first affected, then the sound side of curve and then the video side.
24.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A30, A31, A32	"
25.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A33, A34, A35	"
26.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A36, A37, A38	"
27.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A39, A40, A41	"
28.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A42, A43, A44	"
29.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A45, A46, A47	Adjust for curve similar to Fig. 7. Adjusted in numerical order, the bandwidth is first affected, then the sound side of curve and then the video side.
30.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A48, A49, A50	"
31.	"	"	89MC (10MC Swp)	87.25MC 71.75MC	4	"	A51, A52, A53	"
32.	"	"	83MC (10MC Swp)	81.25MC 85.75MC	3	"	A54, A55, A56	"
33.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A57, A58, A59	"

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1). Set the fine tuning knob 2/3 turn from maximum counter clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
34.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna transformer.	213MC (10MC Swp)	211.25MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A60	Adjust for curve similar to Fig. 5 with marker at 45% on curve.
35.	"	"	201MC (10MC Swp)	199.25MC	11	"	A61	"
36.	"	"	183MC (10MC Swp)	181.25MC	8	"	A62	"
37.	"	"	85MC (10MC Swp)	83.25MC	6	"	A63	"
38.	"	"	79MC (10MC Swp)	77.25MC	5	"	A64	Adjust for curve similar to Fig. 5 with marker at 45% on curve. Adjust by expanding or compressing coil turns.
39.	"	"	69MC (10MC Swp)	67.25MC	4	"	A65	Adjust for curve similar to Fig. 5 with marker at 45% on curve.
40.	"	"	63MC (10MC Swp)	61.25MC	3	"	A66	Adjust for curve similar to Fig. 5 with marker at 45% on curve. Adjust by expanding or compressing coil turns.
41.	"	"	57MC (10MC Swp)	55.25MC	2	"	A67	Adjust for curve similar to Fig. 5 with marker at 45% on curve.

VHF RF AND MIXER ALIGNMENT FOR VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
When checking response tuner shield cover should be in place.
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
42.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer.	213MC (10-15MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (F). Low side to chassis.	A68, A69, A70, A71	Adjust A68, A69 and A70 for maximum amplitude and symmetry similar to Fig. 6. If peaks or the tilt is excessive, knife A71 SLIGHTLY so as not to prevent loss of gain.
43.	"	"	177MC (10-15MC Swp)	175.25MC 179.75MC	7	"	A72, A73, A74	Adjust A72, A73 and A74 for maximum amplitude and symmetry similar to Fig. 6.
44.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to Fig. 6 on all channels (7-13). If necessary, make compromise adjustments of A72, A73 and A74 for desired response on all high band channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
45.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A75, A76, A77	Adjust A75, A76 and A77 for maximum gain on response curve and flatness of top as in Fig. 7. Adjustment is made by knifing coil turns.
46.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A78, A79, A80	Check tracking on channel 5. If necessary, knife A78, A79 and A80 (Fig. 7). (Must not be over 15% off.)
47.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A81, A82, A83	Check tracking on channel 4. If necessary, knife A81, A82 and A83. (Fig. 7). (Must not be over 15% off.)
48.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A84, A85, A86	Check tracking on channel 3. If necessary, knife A84, A85 and A86 (Fig. 7). (Must not be over 15% off.)
49.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A87, A88, A89	Check tracking on channel 2. If necessary, knife A87, A88 and A89 (Fig. 7). (Must not be over 15% off.)

IF INTERFERENCE TRAP ALIGNMENT

A90 is aligned at the factory for approximately 43.5MC. A90 may be readjusted in the field to eliminate any interference between the 40-50MC range.
When adjusting this trap core, care should be exercised so that normal channel 2 response is not affected. Adjust A90 for MINIMUM IF channel interference pattern on screen.

40MC CHANNEL ALIGNMENT OF VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
Remove IF output link at junction of L11 and C35 and terminate with a 68Ω carbon resistor at open end.
Set tuner knob to "UHF" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
50.	Fig. 8	High side thru (Fig. 8) network to point (G). Low side to tuner chassis.	620MC (20MC Swp)	40.5MC 45.75MC	Any UHF channel	Vert. amp. thru 10K to point (F). Low side to chassis.	A91, A92, A93	Adjust for cresponse curve similar to Fig. 9. Adjust A91 and A92 for maximum amplitude. Adjust A93 for maximum gain and zero tilt. Do not allow coils to touch. Disregard possibility of notch caused by the IF trap (A90). Reconnect IF output link to junction of L11 and C35.

UHF TUNER ALIGNMENT

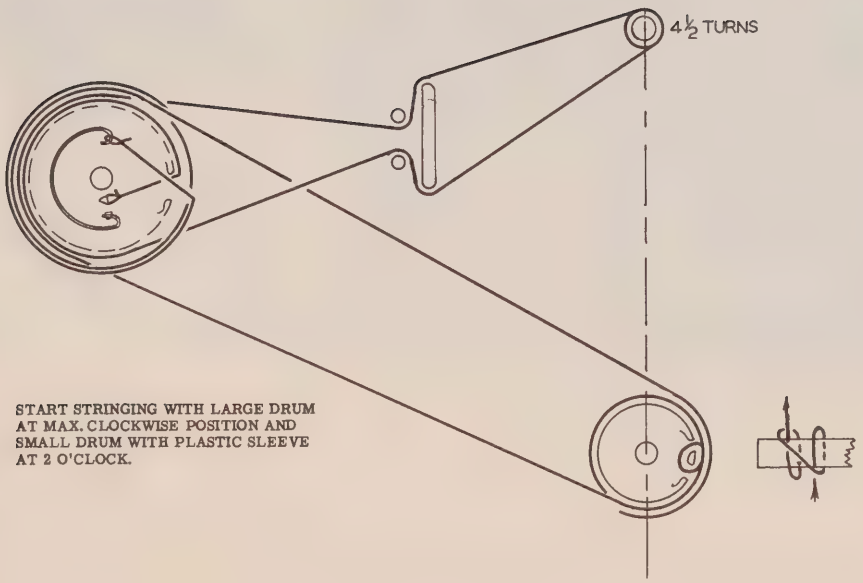
This portion has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RESISTANCE MEASUREMENTS

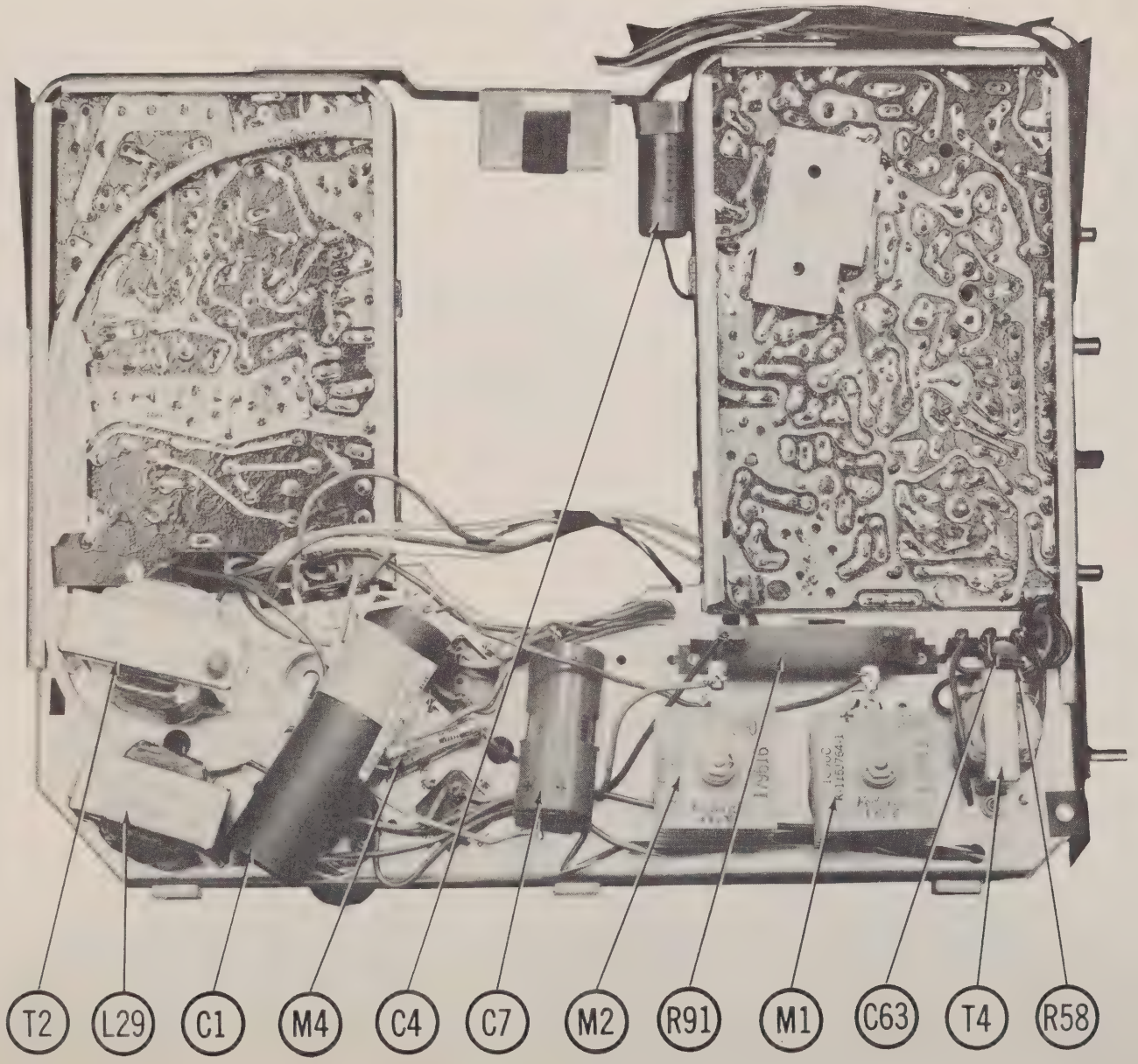
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	6Meg	0Ω	1Ω	2Ω	†37Ω	■22K	0Ω		240K
V2	5BE8	15K	■4700Ω	0Ω	0Ω	1Ω	■.5Ω	■0Ω	0Ω	240K
V3	3AU6	2.5Meg	0Ω	10Ω	9Ω	▲47Ω	▲47Ω	47Ω		
V4	3AU6	270K	INF	10Ω	11Ω	†270Ω	†270Ω	▲47Ω		
V5	3CB6	0Ω	180Ω	12Ω	13Ω	■220Ω	■220Ω	0Ω		
V6	6AU8	0Ω	3Meg	†330K	12Ω	14Ω	82Ω	1Meg	■0Ω-	†4700Ω
V7	3AU6	68K	0Ω	5Ω	6Ω	■330Ω	■330Ω	180Ω		
V8	5T8	INF	22K	INF	6Ω	8Ω	5Meg	0Ω	6.8Meg	†720K
V9	12CA5	70K	■250K	9Ω	8Ω	■250K	†270Ω	†500Ω		
V10	6CM7	*2400Ω	NC	0Ω	16Ω	18Ω	†3.5Meg	850K	2.7Meg	0Ω
V11	6CG7	†15K	2.2Meg	910Ω	5Ω	4Ω	†80K	47K	910Ω	0Ω
V12	12BQ6GTA	TP	21Ω	NC	†12.5K	1Meg	NC	18Ω	0Ω	TOP CAP *28Ω
V13	12AX4GTA	NC	NC	60K	NC	†33Ω	NC	21Ω	24Ω	
V14	1X2A	PINS	1 - 8	HAVE	INFINITE	RESISTANCE				TOP CAP *400Ω
V15	17AVP4A	17Ω	47K	Pin 6 47K	Pin 10 *750K	Pin 11 ■350K	Pin 12 15Ω			

† MEASURED FROM OUTPUT OF M2.
* MEASURED FROM PIN 3 OF V13.
■ MEASURED FROM 125V LINE.
▲ MEASURED FROM PIN 2 OF V4.
NC NO CONNECTION
TP TIE POINT

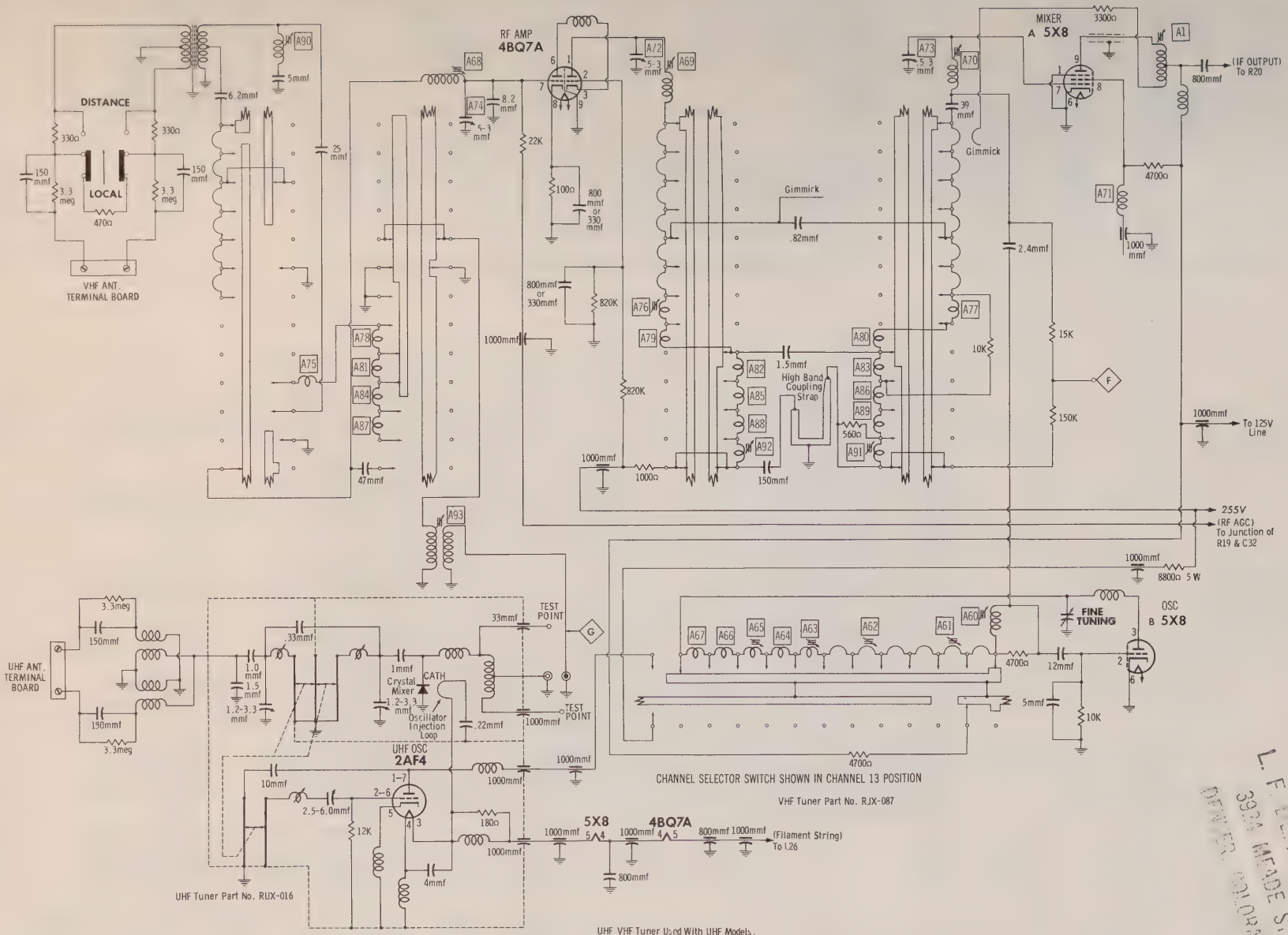
3924 MEADE ST. DENVER, COLORADO



UHF DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF-UHF TUNER SCHEMATIC

GENERAL ELECTRIC
MODELS 17T02, 17T026 ("MM" Line)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer Osc	3BL8	Note 1
V3	1st Video IF Amp.	3AU6	
V4	2nd Video IF Amp.	3AU6	
V5	3rd Video IF Amp.	3CB6	
V6	Video Output - Sync Sep.	6AU8	
V7	Sound IF Amp.	3AU6	

Note - Alternate tube no. 3CL8. Tuner TTX-038 may use either tube. These two tubes should not be interchanged unless necessary. Interchanging will require complete tuner realignment.

ITEM No	USE	TYPE	NOTES
V8	Ratio Det. - AF Amp. - AGC Clamper	5T8	
V9	Audio Output	13C4	
V10	Vert. Mult. - Vert. Output	6CM7	
V11	Horiz. Mult.	6CG7	
V12	Horiz. Output	12BQ6GTA	
V13	Damper	12AX4GTA	
V14	RF Rectifier	1X2A	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: General Electric PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V15	17AVP4A	17AVP4A ①	17AVP4A ② ③	① Aluminized ② Silver Screen '85

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: General Electric PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	RCE-252	AFH81 23	XA226	FPH17	TMS-25	T-050	TVL-1429
C2	125	350	RCE-254	AFH81 43	XA240	FP140	TMS-49	S-230	TVL-1838
C3A	a150	350	AFH81 42-35S	BG170	FP227-7			SJ-302	R2335*
B	a100	50		BR130-5	TC64			MT-13100	
C4	100	10	PRS-2V100	BR81U1	TC2501	TD-100-15		MT-10-210	TVA-1150
C5	4	50	RCE-226	BBR4-50				MT-4504	R2338*
C6	100	150	RCE 232	AAJ241	FP218	TMS-22		S-090	TVL-1423
C7	40	150	RCE-221	BR6035	TC78	TD-40-350		FM-4540	TVA-1511

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: Genera. Electric PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C8	150	500	UCG-032	DI-00015	DD-151	SWST15	ED-150	MC236	1FM-315	
C9	150	500	UCG-032	DI-00015	DD-151	SWST15	ED-150	MC236	1FM-315	
C10	5		RCW-3113	NP0-DI5		Z0U	TCO-5	ZT-555		
C11	13		RCW-3268							
C12	1000		RCW-3269							
C13	1000		RCW-3213	BPD-001	DD-102	KD80	ED-001	DC521	58K-D1	
C14	47		RCW-3287	NT50-D147	TCN-47	ND33	TCT-47	NT-5447	57CU-Q47	
C15	1000		RCW-3289							
C16	56									
C17	24									
C18	5.9		RCW-3255							
C19	15		RCW-3271	NP0-DG15	TC2-15	Z021	TCO-15		5TCC-Q15	
C20	1.5		RCW-3270							
C21	2.7		RCW-3273							
C23	3									
C24	10		UCN-2004	NP0-BI10	TCZ-10	TZ09	TCO-10	ZT-541	5TCC-Q1	
C34	1.5		RCW-3255							
C35	1000		RCW-3289							
C36	1000		RCW-3289							
C37	1000		RCW-3213	BPD-001	DD-102	KD80	ED-001	DC521	58K-D1	
C38	1.5		RCW-3270							
C39	1000		RCW-3213	BPD-001	DD-102	KD80	ED-001	DC521	58K-D1	
C40	1000		RCW-3213	BPD-001	DD-102	KD80	ED-001	DC521	58K-D1	
C41	1000		RCW-3289							
C31	1000		RCW-3289							
C32	.047	200							2SE-P022	
C33	30000		RCW-3247	BPD-03	DD-203	KD65	ED-02		ACE6022	
C34	30	500	RCC-007	NP0-BI30	TCZ-30	TZ13	TCO-30	ZT-542	5TCC-Q2	
C35	680		RCW-3237	BPD-0008	DD-801	G087	ED-0008		5GA-T8	
C36	.047							ACE8147	2SE-S47	
C37	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C38	680		RCW-3231	BPD-0008	DD-681	KD80	ED-680	UC-5368	5GA-T8	
C39	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C40	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C41	680		RCW-3231	BPD-0008	DD-681	KD80	ED-680	UC-5368	5GA-T8	
C42	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C43	750		RCW-3211	DI-00075	DD-751	G086	ED-750	UC-5375	5GA-T75	
C44	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C45	5		RCW-3057	NP0-5R5	TC2-5R7	Z011	TCO-5	ZT-555	5TCCB-V47	
C46	8		RCW-3057	NP0-DI5	TC2-5R7	Z011	TCO-5	ZT-555	5TCCB-V47	
C47	.047	200						ACE8147	2SE-S47	
C48	33		RCC-125	NP0-DI33	TCZ-33	Z029	TCO-33	ZT-5433	5TCC-Q33	
C49	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C50	47		RCW-3259	BPD-000047	DD-470	G033	ED-47	UC-5447	5GA-Q47	
C51	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C52	.1	400						ACE408	4SE-P1	
C53A	10000	1000	RCW-3284		DD-103				10HK-S1	
B	10000	1000			DD-103				10HK-S1	
C54	36		RCW-3173	NP0-DI30	TCZ-30	Z023	TCO-30	ZT-542	5TCU-Q2	
C55	47		RCW-3256	BPD-000047	DD-470	G033	ED-47	UC-5447	5GA-Q47	
C56	5000		RCW-3014	BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C57	5000		RCW-3014	BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C58	800		RCW-3237	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C59	5000			BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C60	5000			BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C61	10000		RCW-3188	BPD-01	DD-103	KD82	ED-01	DC511	5HK-S1	
C62	10000		RCW-3186	BPD-01	DD-103	KD82	ED-01	DC511	5HK-S1	
C63	10000		RCW-3186	BPD-01	DD-103	KD82	ED-01	DC511	5HK-S1	
C64	5000		RCW-3014	BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C65	5000		RCW-3014	BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C66	470		RCW-3234	6B470	DS-471	TP46	DP-470	UC-5347	5GA-T47	
C67	.15	600	RCW-311	P468K-15		CUB4P15		GEM-4015	4TM-P15	
C97	.015	1000								
C68	.033	600								
C69	.033	600							4SE-S15	
C70	.0039	600								
C71	800		RCW-3184	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C72	.015	1000								
C73	100		RCW-3258	NP0-DI00	DD-101	TZ30	TCO-100	ZT-531	5TCC-T1	
C74	82		RCW-3237	1469-4000S3	TCZ-82	1Z82K502	TCO-82		MS-482	
C75	1300		RCW-3187	1464-0013		1R5D13	ED-1300		MS-212	
C76	470		RCW-3265	BPD-00047	DD-471	KD80	ED-470		5GA-T8	
C77	1300		RCW-3187	1464-0013		1R5D13	ED-1300		MS-212	
C78	5000		RCW-3188	BPD-005	DD-503	KD80	ED-005	DC525	5HK-D5	
C79	.1	200		PSBM-1	DP-104	CUB2P1			2TM-P1	
C80	800	500	RCW-347	1464-0009H		1R5T81			MS-391	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C81	0047	600								
C82	5000		RCW-3014	BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C83	820		RCW-3262	BPD-0008	DD-821	G087	ED-820		5GA-T82	
C84	1	600								Note 1
C85	270	3000								
C86	10000		RCW-3188	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C87	180	1500	RCW-3281							
C88	800		RCW-3037	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C89	800		RCW-3037	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C90	800		RCW-3037	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C91	800		RCW-3037	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	
C92	800		RCW-3037	BPD-0008	DD-801	G087	ED-0008	UC-5375	5GA-T8	

Note 1: Some versions may use 360MMF in this application. (Part no. RCW-3260)

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	500Ω	1	RRC-378					Volume Control
B	Shaft		Not Req.					Attach to R1A
C	Switch		Not Req.					Attach to R1A
R2	300K	1	RRC-377					Brightness Control
R3	1.5Meg	1	RRC-380					Vertical Hold
R4	15K	1	RRC-379					Contrast Control (Tap @ 10K)
R5	1Meg	1	RRC-383					Horizonal Hold
R6	500K	1/4	RRC-382					Height Control
R7	3Meg	1	RRC-381					Vertical Linearity

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: General Electric PART No.	IRC PART No.	NOTES
R8	3.3Meg			BTS-3.3Meg	
R9	3.3Meg			BTS-3.3Meg	
R10	470Ω			BTS-470	
R11	330Ω			BTS-330	
R12	330Ω			BTS-330	
R13	15K			BTS-15K	
R14	33K			BTS-33K	
R15	4700Ω			BTS-4700	
R16	330K			BTS-330K	
R17	4700Ω			BTS-4700	
R18	15K			BTS-15K	
R18	3.3Meg				
R19	22Ω				
R31	7500Ω	5%			
R33	3.3Meg				
R22	47Ω			BTS-47	
R24	47Ω			BTS-47	
R25	470K				
R26	470K				
R27	15K				
R28	220Ω			BTS-220	
R29	47Ω			BTS-47	
R30	15K			BTS-15K	
R31	220Ω			BTS-220	
R32	180Ω			BTS-180	
R33	2900Ω				
R34	2.6Ω	5%			
R35	1Meg			BTS-5000	
R36	5000Ω	3		BTS-82	
R37	82Ω			BTS-220	
R38	220Ω			BTS-5200	
R39	68K			BTS-68K	
R40	15K			BTS-15K	
R41	470K			BTS-470K	
R42	3.3Meg			BTS-3.3Meg	
R43	1.2Meg			BTS-1.5Meg	
R44	3.3Meg	5%			
R45	3.3Meg	5%			
R46	3.3Meg				
R47	3.8Meg				
R48	330Ω			BTS-330	
R49	180Ω			BTS-180	
R50	220Ω			BTS-220	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: General Electric PART No.	IRC PART No.	NOTES
R51	22K			BTS-22K	
R52	6.8Meg			BTS-6.8Meg	
R53	680K			BTS-680K	
R54	470K	5%		BTS-470K 5%	
R55	1000Ω			BTS-1000	
R56	500K	5%		BTS-500K 5%	
R57	270Ω		1	BTA-270	
R58	1Meg			BTS-1Meg	
R59	22K			BTS-22K	
R60	470K			BTS-470K	
R61	330K			BTS-330K	
R62	47K			BTS-47K	
R63	100K			BTS-100K	
R64	3.3Meg			BTS-3.3Meg	
R65	68K			BTS-68K	
R66	47K			BTS-47K	
R67	1Meg			BTS-1Meg	
R68	330K			BTS-330K	
R69	150K			BTS-150K	
R70	2200Ω				
R71	3300Ω				
R72	15K			BTS-15K	
R73	47K			BTS-47K	
R74	560K				
R75	680K				
R76	100K				
R77	1.5Meg				
R78	90K				
R79	15K		1		
R80	47K				
R81	1.2Meg				
R82	82K			BTS-82K	
R83	8000Ω	5%			
R84	12K				
R85	1Meg				
R86	100Ω				
R87	12K		2	BTB-12K	
R88	270K		1		
R89	330K		1		
R90	2.2Ω			M-RRW-147	BW1-2.2
R91	4Ω		25	M-RRW-148	25DA-25-50
R92	7.5Ω		15	M-RRW-149	25DA-25-7.5

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: General Electric PART No.	Hallodorson PART No.	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	RTO-188				B135 1* ③	V35 ①	A-5141 ②	A-109X 2-3
T2	Vert. Output Trans.	RTO-189	Z1807 ①	A 2824 ①		A-5141 ②	A-5141 ②	26B54 ②	A-109X 2-3
T3A	Yoke(90°) Horiz.10.5MHz	RLD 071 ④ ⑤	DY800 ④ ⑤	MDY-21 ④ ⑤	Z37D ④ ⑤	T90F12/42 ④ ⑤	DY-13A ④ ⑤	Y-14 ④ ⑤	Y-40-1 ④ ⑤
B	Vert(SEMD)	RLD-076 ④ ⑤							
		RMC-086 ④							
		RRH-012 ④							

① Cut and tape blanking winding lead.
② Drill new mounting hole(s).
③ Connect as auto. trans.
④ Used in early production only.
⑤ Does not include clamp or retaining ring.
⑥ Used in later production.
⑦ Includes clamp and retaining ring.
⑧ Yoke clamp.
⑨ Yoke clamp retaining ring.
⑩ Requires new clamping device.
⑪ Connect horiz. yoke term #3 to horiz. output trans. term #2; connect horiz. yoke term #1 to horiz. output trans. term #1.
⑫ Connect horiz. yoke damping network across terms #3 and #1.
⑬ Use original mounting bracket.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Hallodorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4				3			
5				8			
2				2			
1				1			
3				4			
Special Note: →				⑭			

⑭ Change value of resistor R87, if necessary, to remove drive lines.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	General Electric PART No.	Hallodorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T4	5.7K	3-4Ω	RTO-178	21105 ① ②	A-3031 ① ③		22G48 ①	S-16X ① ②	① Drill one new mtg. hole. ② Tape unused hum-reducing tap.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: General Electric PART No	QUAM PART No	RCA PART No	NOTES
SP1	4"	PM	3-4Ω	ROP-035	4A01	22S51	

COILS (RF-IF)

ITEM No.	USE	General Electric PART No.	NOTES
L1	Ant. Trans.	RLA-046	
L2	Ant. Coils	RRK-088	
L3	RF Coils	RRH-089	Includes C18
L4	Mixer Grid Coils	RRK-070	Includes C17 & C18

ITEM No.	USE	General Electric PART No.	NOTES
L5	Osc. Coils	RRK-071	Includes L6
L6	Osc. Coil	RLI-373	Channel 8
L7	Osc. Coil	RLI-372	Channel 13
L8	RF Choke	RLI-375	
L9	Conv. Plate	RLI-374	

ITEM No	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L10	47.25MC Trap	9Ω		RLI-364				
L11	RF Choke	6Ω		RLI-360				.1 Microhenry
L12	1st Video IF	0Ω		RLI-361				
L13	2nd Video IF	.1Ω	.1Ω	RTL-194	17-5014			
L14	3rd Video IF	.3Ω	.1Ω	RTL-195	17-5014			
L15	4th Video IF Shunt	.1Ω		RLI-362				
L16	Peaking Coil	0Ω		RLI-301				.22 Microhenry
L17	Series Peaking Coil	3.2Ω				19-3098		31 Microhenries
L18	Series Peaking Coil	4.5Ω		RLI-340		19-1004	4610	5.6 Microhenries; IRC part #CLA
L19	Shunt Peaking Coil	11.5Ω		RLI-367		19-4400	6136	150 Microhenries
L20	Series Peaking Coil	4.8Ω		RLI-307	19-3100	TV-181	6113	100 Microhenries
L31	Fil. Choke	1.6Ω		RLI-122	19-1002		4606	3.3 Microhenries; IRC part #CLA
L32A	4.5MC Trap	3.2Ω		RLI-363				
B	Sound IF	3.7Ω						
L33	Shunt Peaking Coil	18Ω		RLI-368		19-4080		820 Microhenries
L34	Series Peaking Coil	8.5Ω		RLI-315				300 Microhenries
L35	Ratio Det.	1.5DCT		RTD-098		17-5499		Tertiary winding - .5Ω
L36	Fil. Choke	1.6Ω		RLI-122	19-1002		4606	3.3 Microhenries; IRC part #CLA
L37	RF Choke	8.2Ω		RLI-138	19-1005		4613	10 Microhenries; IRC part #CL-L

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES: PRI	SEC	General Electric PART No.	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No.	Ram PART No	Thordarson PART No	NOTES
L38	72Ω		RLI-365							

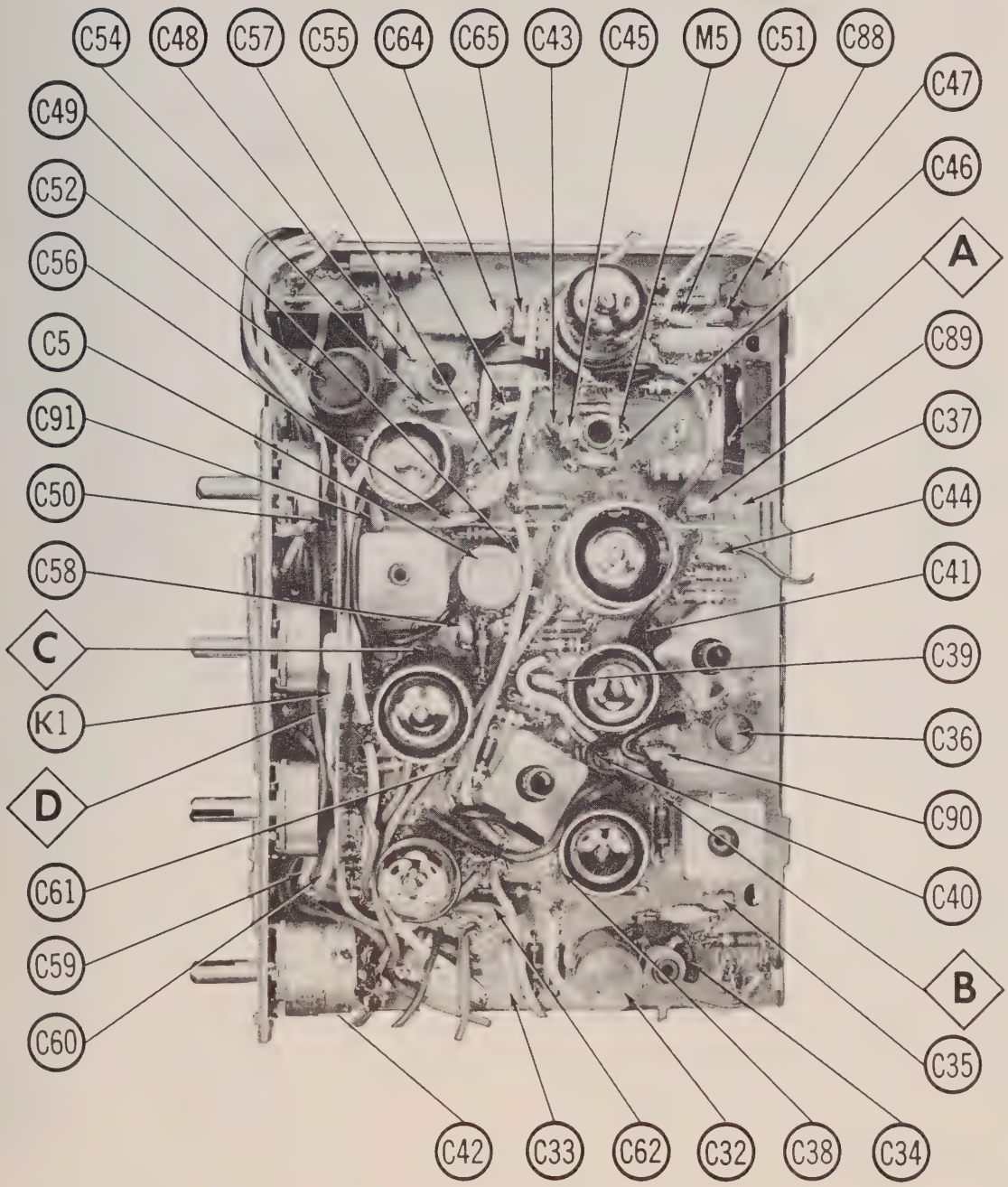
FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT (1000 ^C.)	General Electric PART No.	REPLACEMENT DATA: Hallodorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L39	210A	37Ω	1HY	RLF-073	C6040	C-3994	C-2327	28C41	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	General Electric PART No.	REPLACEMENT DATA
K1	De-emphasis Network	22K, 1000MMF, 4000MMF, 10000MMF	RRK-013	Aerovox P4425 Centralab PC-166 Cornell-Dubilier Erie Sprague
K3	Vertical Integrator	15K, 68K, 100K, 800MMF, 3000MMF	RRK-015	Aerovox Centralab Cornell-Dubilier Erie Sprague

PROPERTY OF
L. F. BLA
3924 MU
DENVER, COLO



SOUND IF & VIDEO IF PRINTED CIRCUIT CAPACITOR IDENT.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	General Electric PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	. 210A	RER-015	1238A	MR350	6S300	5QS1	350A	
M2	. 210A	RER-015	1238A	MR350	6S300	5QS1	350A	

SELENIUM DIODE

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	General Electric PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M3		RER-023		1T1 ①				① 2 required.

FUSES

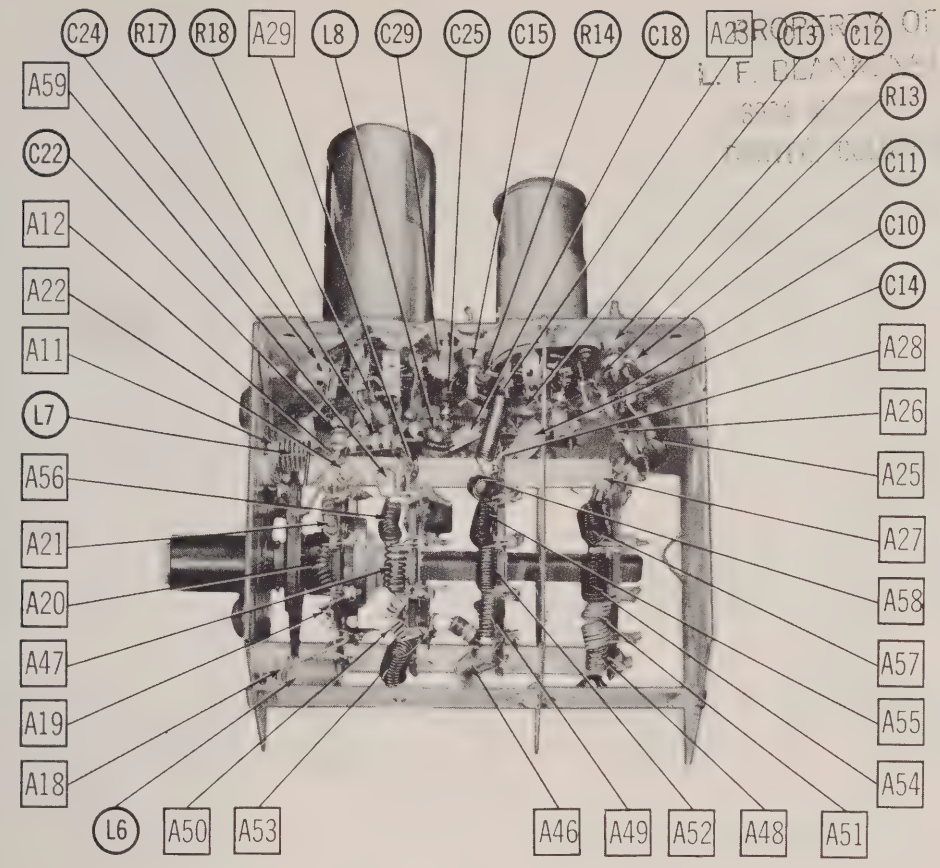
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			General Electric PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG P/T S/B	2A			315002. (3AG-P/T-S/B-2A)		MDV2	

CRYSTAL DIODES

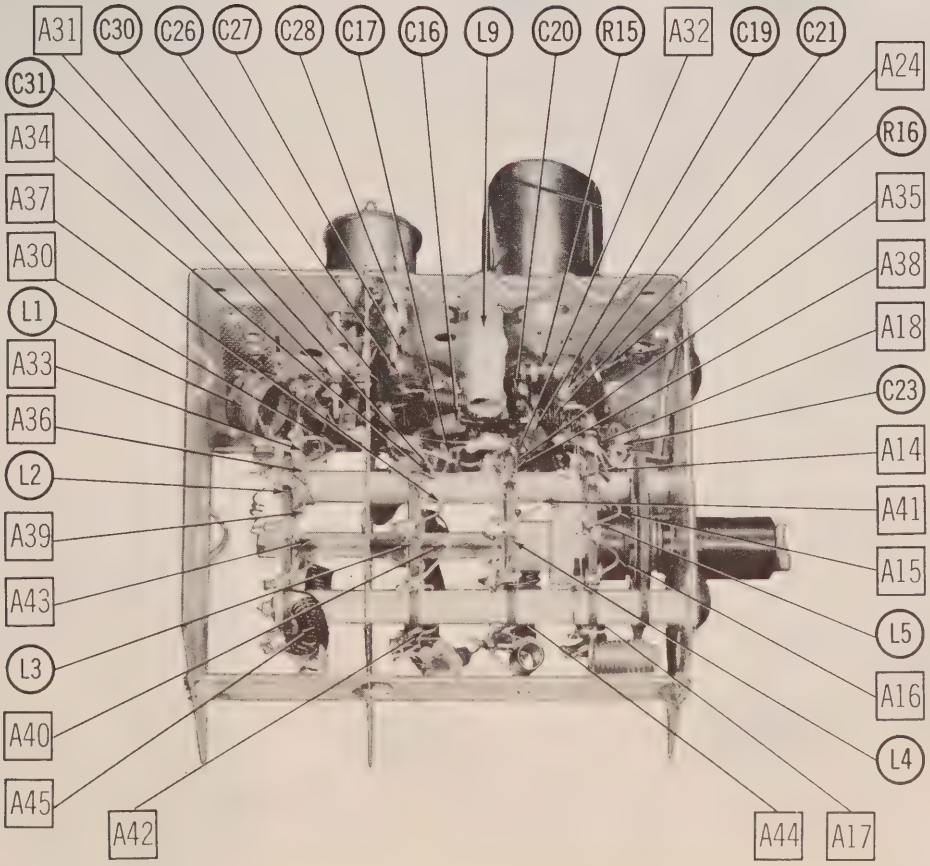
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		General Electric PART No.	SYLVANIA PART No.	
M5	1N87G	RED-001	1N60	(Pigtail)

MISCELLANEOUS

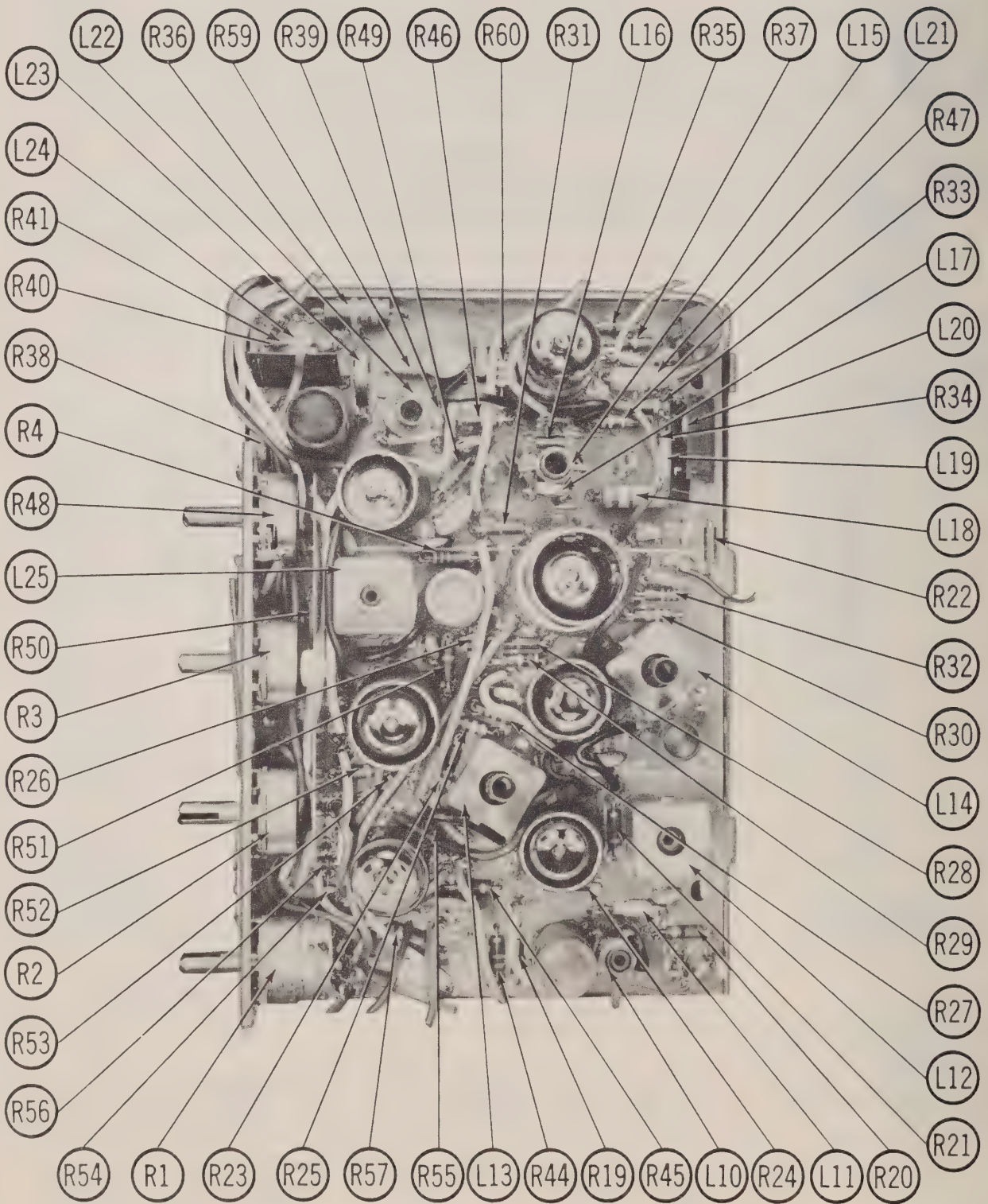
ITEM No.	PART NAME	General Electric PART No.	NOTES
M6	Tuner	RJX-086	VHF - Used in VHF Models.
	Tuner	RJX-087	VHF - Used in UHF-VHF Models.
	Tuner	RUX-016	UHF - Used in UHF-VHF Models.
M7	Switch	RSS-011	Local-Distant, (DPDT - Slide Type)
M8	Centering Device	REA-013	
M9	Ion Trap	RET-010	
	Cabinet	RAC-196	Front, Model 17T025
	Cabinet	RAC-197	Front, Model 17T026
	Cabinet	RAV-1018	Body, Model 17T025
	Cabinet	RAV-1019	Body, Model 17T026
	Knob	RDK-527	Selector, UHF-VHF Models
	Knob	RDK-530	Tuning, Clear
	Knob	RDK-586	On-Off-Volume, Vertical, Contrast and Brightness
	Knob	RDK-587	Selector, VHF Models
	Knob	RDK-064	UHF Dial
	Glass	RDW-113	
	Handle	RHY-084	



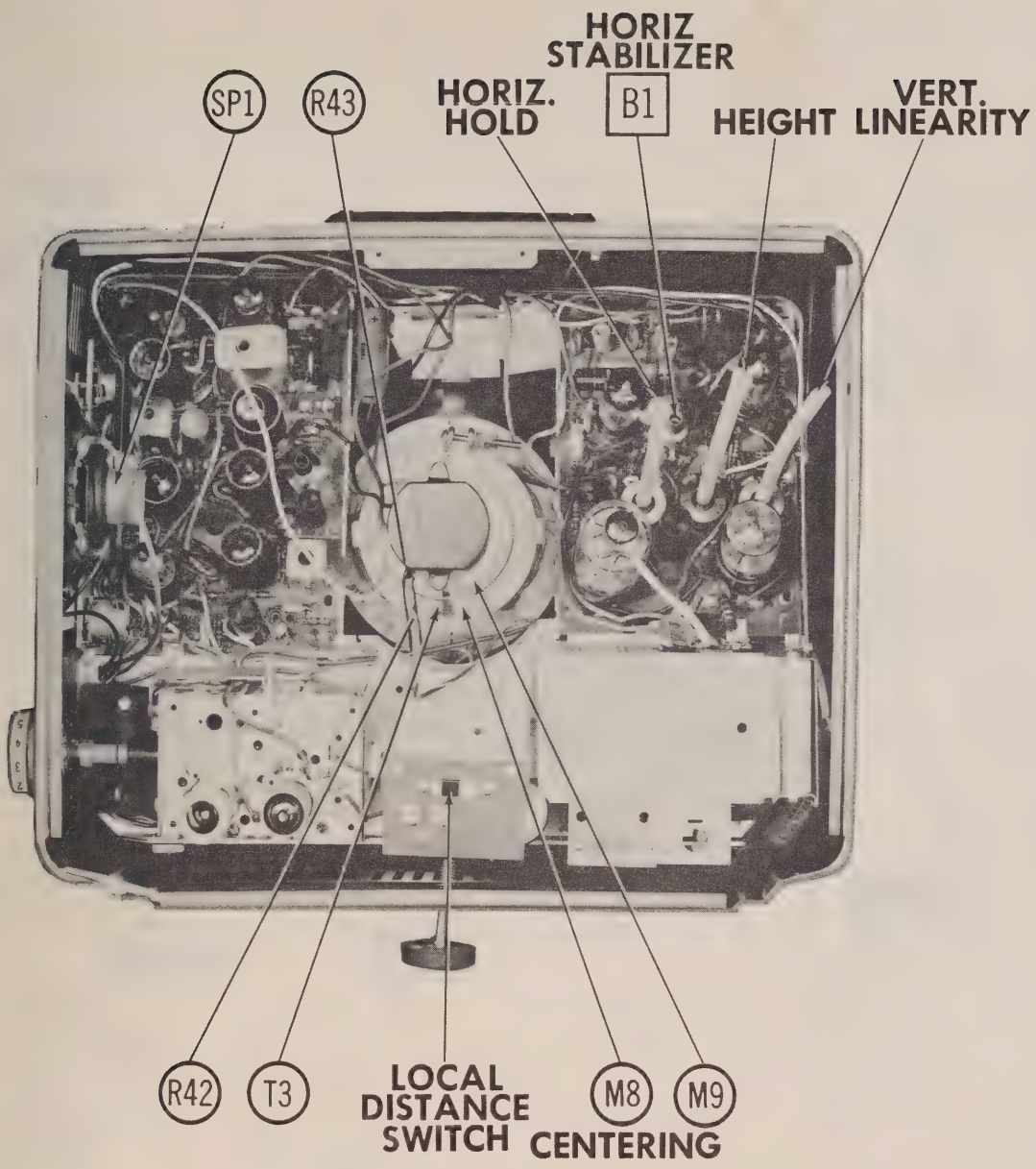
RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



SOUND IF & VIDEO IF PRINTED CIRCUIT RESISTOR IDENT.



CABINET—REAR VIEW

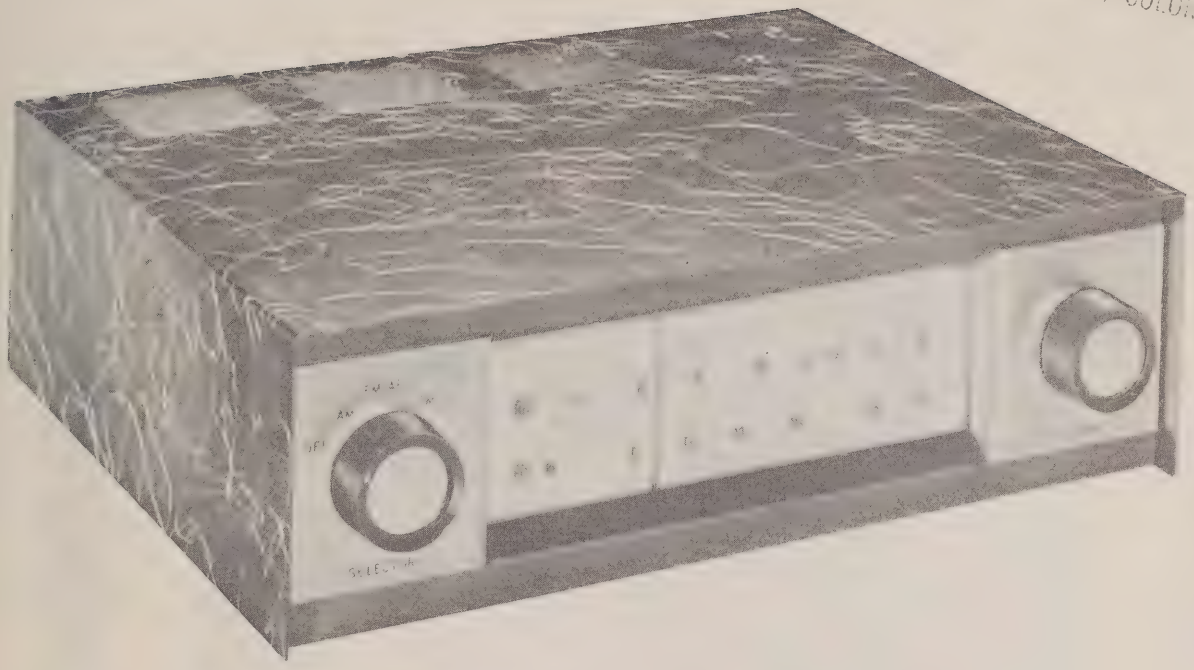
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn set on and tune in a TV station, preferably with a test pattern.
2. Short point Ⓗ to chassis with a clip lead.
3. Connect a 1000Ω resistor across horizontal stabilizer coil (L28).
4. Adjust horizontal hold control so that picture floats back and forth across screen.
5. Remove the resistor from across L28 and adjust B1 (horizontal stabilizer) so that the picture again floats back and forth across screen.
6. Remove clip lead from point Ⓗ to chassis. Readjust the horizontal hold control slightly if necessary.

KNGIHT
MODEL 94SX703

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

KNGIHT
MODEL 94SX703



KNGIHT
MODEL 94SX703

TRADE NAME	Knight Model 94SX703	
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.	
TYPE SET	AC Operated FM-AM Superheterodyne Tuner	
TUBES	Eight	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .30 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	535KC-1650KC	FREQ. MOD. 88MC-108MC

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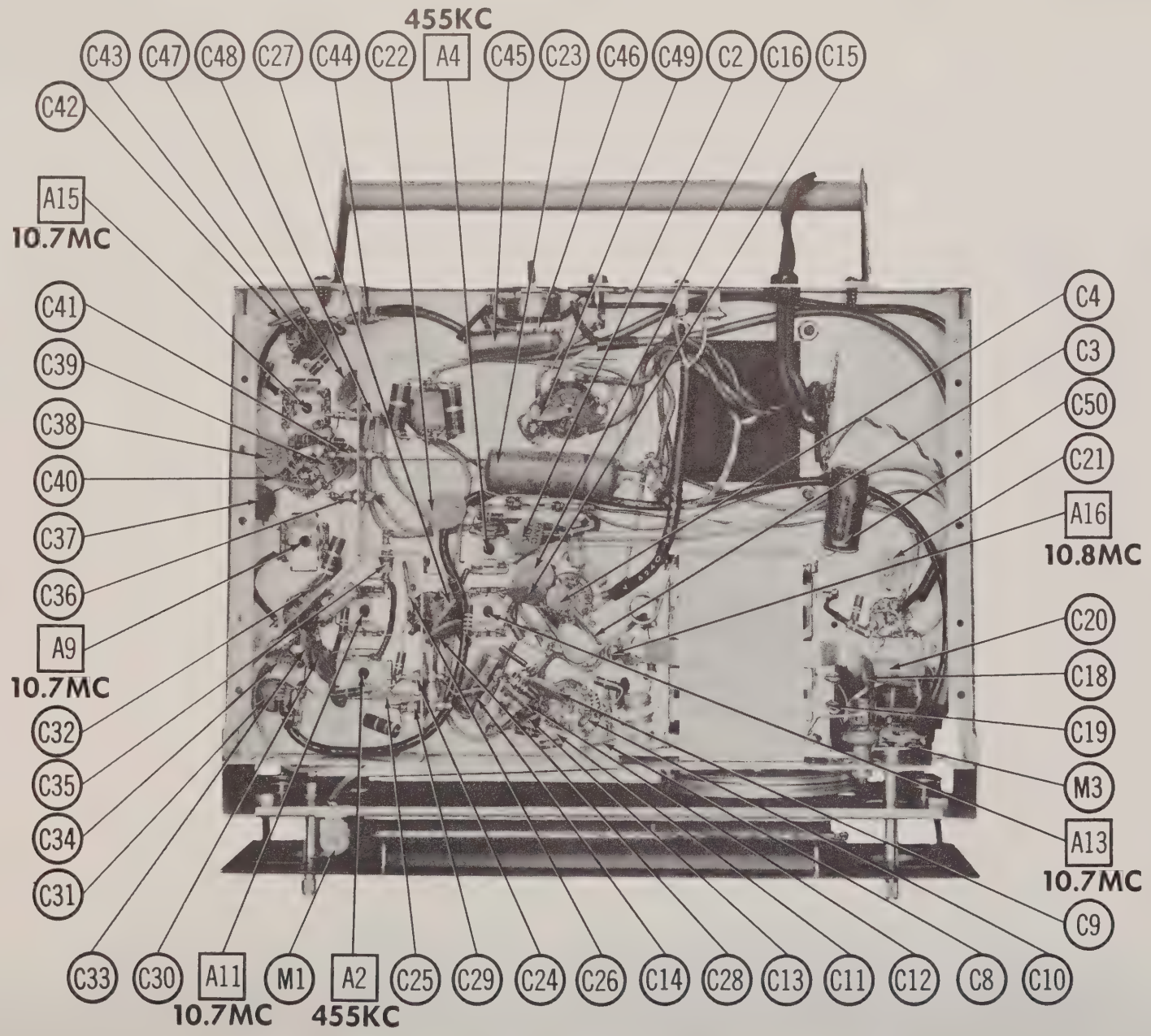
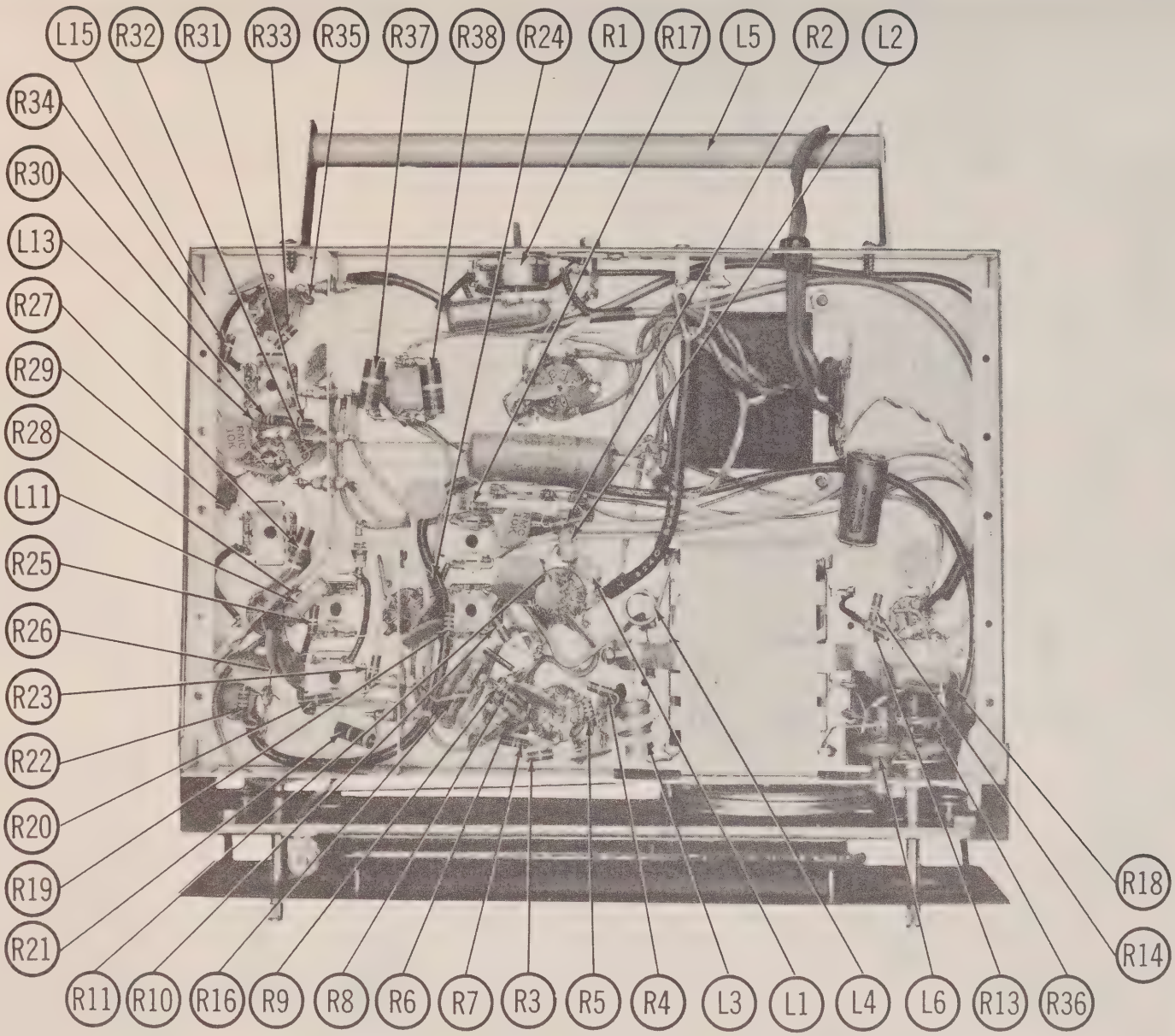


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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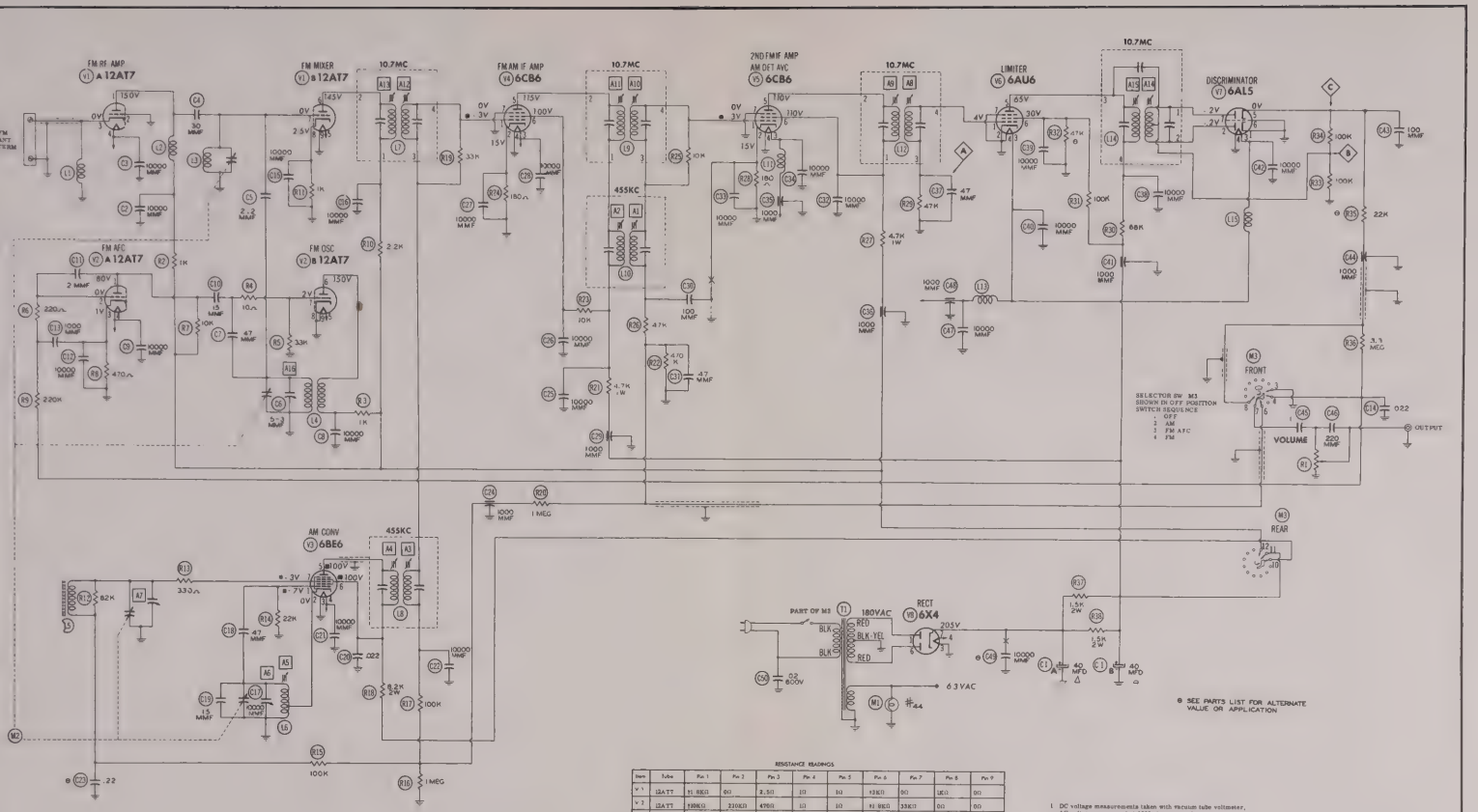
KNIGHT
MODEL 94SX703



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V-1	12AT7	11.8KΩ	0Ω	2.5Ω	1Ω	1Ω	42KΩ	0Ω	1EΩ	0Ω
V-2	12AT7	190KΩ	230KΩ	470Ω	1Ω	1Ω	82.8KΩ	33KΩ	0Ω	0Ω
V-3	6BE6	22KΩ	5Ω	0Ω	.1Ω	1.6KΩ	1.6KΩ	700KΩ		
V-4	6CB6	700KΩ	180Ω	.1Ω	0Ω	15.5KΩ	11KΩ	0Ω		
V-5	6CB6	400KΩ	180Ω	.1Ω	0Ω	15.5KΩ	15.5KΩ	0Ω		
V-6	6AU6	47KΩ	0Ω	.1Ω	0Ω	1.100K	470KΩ	0Ω		
V-7	6AL5	0Ω	100KΩ	1Ω	0Ω	200KΩ	0Ω	150KΩ		
V-8	6X4	200Ω	NC	0Ω	.1Ω	TP	200Ω	150KΩ		

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 7 OF V8.
● MEASURED IN AM POSITION
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400~Mod)	AM	Point of non-interference	AC probe to output jack. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop (Radiated)	600KC	"	600KC	"	A5	Adjust for maximum deflection. Repeat steps 1 and 2 until no further increase can be detected.
3.		"	1500KC	"	Tune to 1500KC signal	"	A6, A7	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A8, A9, A10, A11 A12, A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	"	"	"	"	"	A15	Readjust A14 for slight deflection. Adjust A15 for maximum deflection. Repeat step 5.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A8, A9, A10, A11 A12, A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A15	"
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A14	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A15 for maximum amplitude and straightness of crossover lines. Proceed with step 7.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	Thru 270Ω to FM antenna terminal. Low side to chassis.	88MC (Unmod)	FM	88MC	DC probe to point (C). Common to chassis.	L4	Compress or expand coil turns for zero reading.
8.	"	"	108MC	"	108MC	"	A16	Adjust for maximum deflection.
9.	"	"	88MC	"	88MC	DC probe to point (A). Common to chassis.	L3	Compress or expand coil turns for maximum deflection.

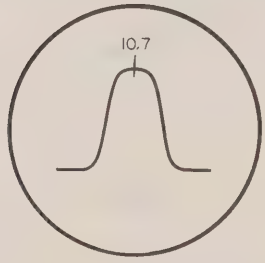


FIG. 1

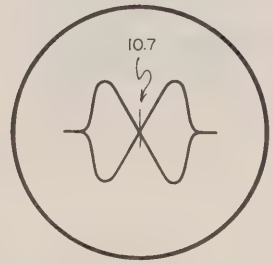


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.-FM Mixer	12AT7	
V2	FM Osc.-FM AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st. FM-AM IF Amp.	6CB6	
V5	2nd. FM IF Amp.-AM Det.-AVC	6CB6	

ITEM No.	USE	TYPE	NOTES
V6	Limiter	6AU6	
V7	Discriminator	6AL5	
V8	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300		AFH2-33	B0260	FP217.87	TMD31	D-130	TVL-2575
B	▲40	300							

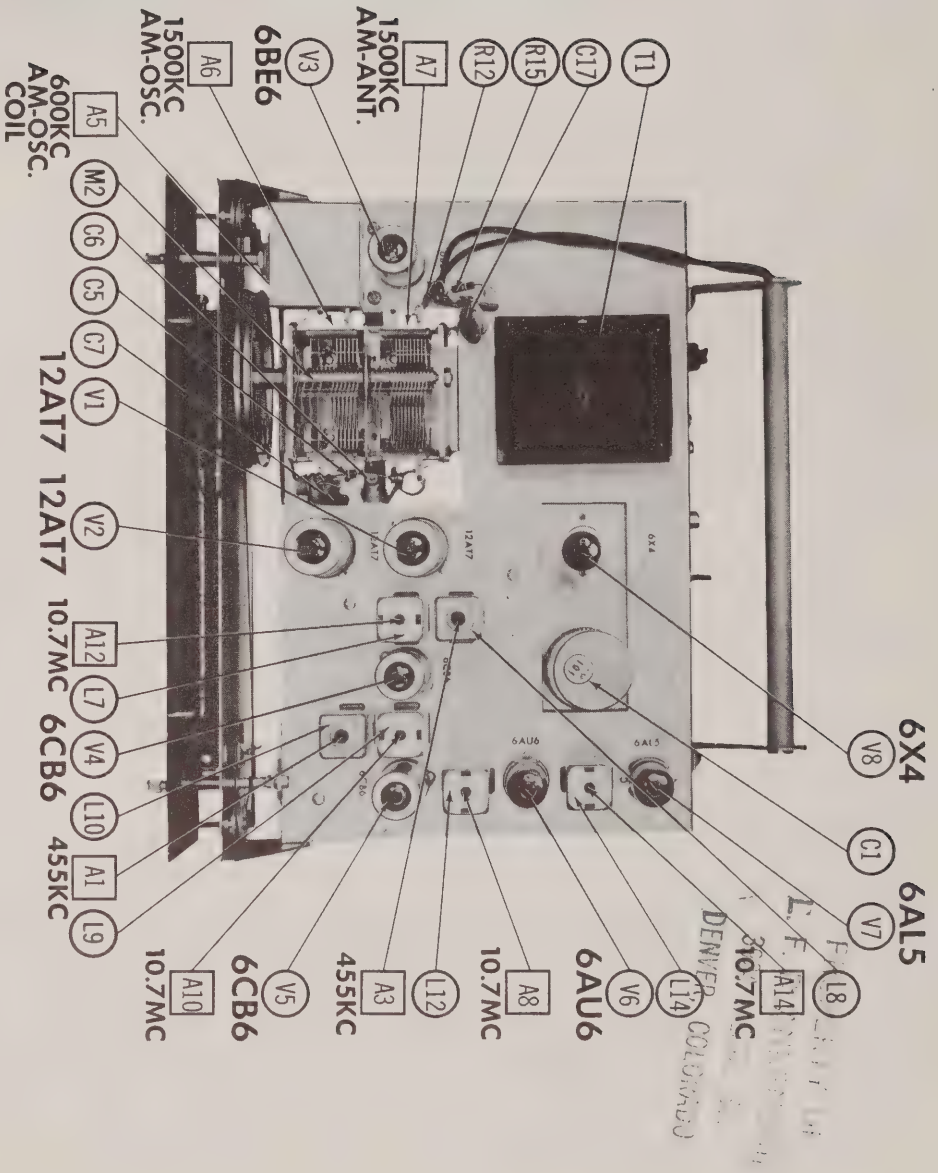
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	30									
C5	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C6	.5-3				829-3		3115-01-0R5	CT565A		
C7	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C8	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C10	15			NP0-DI15	TCZ-15	Z021	NP0K-150		5TCC-Q15	
C11	2			NP0-SI2.2	TCZ-2R2	Z005	NP0A-2R2		5TCCB-V22	
C12	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C13	1000			DI-001		G069	811-102	UC-521	5GA-D1	
C14	.022	200		BPD-02	DD-203	CUB4S22	817-02	PT4122	2TM-S22	
C15	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	47			NP0-DI47	TCZ-47	Z033	NP0-337-470	ZT-5447	5TCC-Q47	
C19	15			NP0-DI15	TCZ-15	Z021	NP0K-150		5TCC-Q15	
C20	.022	200		BPD-02	DD-203	CUB4S22	817-02	PT4122	2TM-S22	
C21	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	.22	1000								Note 1
C24	1000									
C25	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C28	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	1000									
C30	100			NP0-DI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C31	47			NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C32	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C33	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C34	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C35	1000									
C36	1000									
C37	47			NP0-DI47	TCZ-47	Z033	NP0-337-470	ZT-5447	5TCC-Q47	
C38	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C39	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C40	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C41	1000									
C42	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C43	100			NP0-DI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C44	1000									
C45	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C46	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C47	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C48	1000									
C49	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 2
C50	.02	600		P689X-02				OT-103	PX-126	

Note 1. Some versions use .18MFD in this application.
Note 2. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	RP-504AF			B13-133	TA55A	Volume
B	Shaft		Not Req.			TM-2K1T	Not Req.	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R2	1000Ω			BTS-1000	
R3	1000Ω			BTS-1000	
R4	10Ω			BTS-10	
R5	33KΩ			BTS-33K	
R6	220Ω			BTS-220	
R7	10KΩ			BTS-10K	
R8	470Ω			BTS-470	
R9	220KΩ			BTS-220K	
R10	2200Ω			BTS-2200	
R11	1000Ω			BTS-1000	
R12	82KΩ			BTS-82K	
R13	330Ω			BTS-330	
R14	22KΩ			BTS-22K	
R15	100KΩ			BTS-100K	
R16	1Meg			BTS-1Meg	
R17	100KΩ			BTS-100K	
R18	8200Ω	2		BTB-8200	
R19	33KΩ			BTS-33K	
R20	1Meg			BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R21	4700Ω	1		BTA-4700	
R22	470KΩ			BTS-470K	
R23	10KΩ			BTS-10K	
R24	180Ω			BTS-180	
R25	10KΩ			BTS-10K	
R26	47KΩ			BTS-47K	
R27	4700Ω	1		BTA-4700	
R28	180Ω			BTS-180	
R29	47KΩ			BTS-47K	
R30	68KΩ			BTS-68K	
R31	100KΩ			BTS-100K	
R32	47KΩ			BTS-47K	Note 1
R33	100KΩ 5%			BTS-100K 5%	
R34	100KΩ 5%			BTS-100K 5%	
R35	22KΩ			BTS-22K	Note 2
R36	3.3Meg			BTS-3.3Meg	
R37	1500Ω	2		BTB-1500	
R38	1500Ω	2		BTB-1500	

Note 1. Some versions use 51KΩ resistor in this application.
Note 2. Some versions use 27KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.3A	350VCT @.044A	6.3VAC @2.8A						22R38	

COILS (RF-IF)

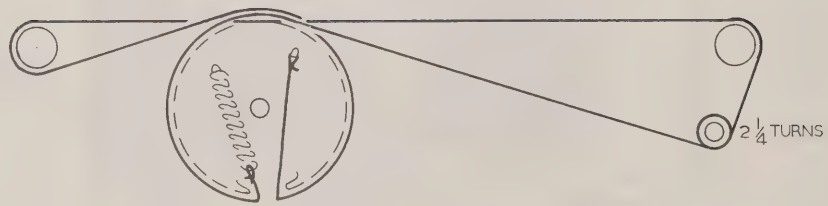
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	KNIGHT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Cathode Choke	3Ω						3.3 Microhenries, (IRC part #C1A)
L2	RF Coil	3Ω						3.3 Microhenries, (IRC part #CLA)
L3	FM RF Coil	0Ω		LL-0054				
L4	FM Osc. Coil	0Ω	0Ω	LL-0055				
L5	AM Ant. Coil	.2Ω		LW-0098				
L6	AM Osc. Coil	5.5Ω		LL-0049				Tapped @.3Ω
L7	1st. FM IF	.5Ω	.5Ω	LR-0032	16-3487	FM-254	1463	
L8	1st. AM IF	15Ω	15Ω	LR-0041	16-6758	BC-352	12-C1	
L9	2nd. FM IF	.5Ω	.5Ω	LR-0033	16-3487	FM-254	1463	
L10	2nd. AM IF	15Ω	15Ω	LR-0041	16-6758	BC-353	12-C2	
L11	Fil. Choke	.44Ω			19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)
L12	3rd. FM IF	.5Ω	.5Ω	LR-0033	16-3487	FM-254	1463	
L13	Fil. Choke	.44Ω			19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)
L14	Discriminator	.5Ω	.8ΩCT	LQ-0179	17-3494	FM-253	1464	
L15	Fil. Choke	.44Ω			19-3001	TV-189	6175	.68 Microhenry (IRC part #CLA)

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Dial Light		#44
M2	Tuning Cap.	CV-601	4 Gang (AM sections: 21-465MMF, 19-190MMF)
M3A	Switch		On-off (power) SPST
B	Switch		Selector (Rotary, wafer type)

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING

RETMA MEMBER

MAGNAVOX
CHASSIS CR729AA, BA

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
[illegible]VER, COLORADO

MAGNAVOX
CHASSIS CR729AA, BA

MAGNAVOX
CHASSIS CR729AA, BA

TRADE NAME	Magnavox Chassis CR729AA, CR729BA
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Ind.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	4 Volts — RATING 9MA @ 4 Volts DC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across earphone jack	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	535KC	Tuning gang fully closed	"	A6	"

Note: Chassis number was not stamped on initial production chassis. These chassis are CR729AA.

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
CHASSIS CR729AA

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	2N172	
X2	1st. IF Amplifier	2N145	Note 1
X3	2nd. IF Amplifier	2N147	Note 1
X4	AF Amplifier	310	
X5	Output	353	Note 2
X6	Output	353	Note 2

Note 1. Chassis CR729AA may use type 2N146 for X2 and X3. Chassis CR729BA may use type R03 for X2 and X3. Some CR729BA chassis may use type R02 for X2 and type R04 for X3.
Note 2. Type 2N185 is used in Chassis CR729BA.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	6	25E105-4	XPP6V50	EC50-10		ML-40-6		TE-1095
C2	10	6	25E105-3	XPP6V10	EC10-6	TAP25-10	ML-10-6		TE-1087
C3	50	6	25E105-4	XPP6V50	EC50-6		ML-40-6		TE-1095
C4	50	6	25E105-4	XPP6V50	EC50-6		ML-40-6		TE-1095
C5	50	6	25E105-4	XPP6V50	EC50-6		ML-40-6		TE-1095

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.05	200	23E4010							
C7	10000		23E4009	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	16		23E4001-39							Note 1
C9	.05	200	23E4010							
C10	10000		23E4009	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 2
C11	.05	200	23E4010							
C12	50000		23E4008							
C13	10000		23E4009	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C14	10000		23E4009	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C15	18		23E4001-38							
C16	5000		23E4009-2	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C17	100000		23E4008-2							Note 2

Note 1. Chassis CR729BA use 10MMF in this application (Part # 23E4001-40).
Note 2. Not used in Chassis CR729BA.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	28E174					Volume & Switch

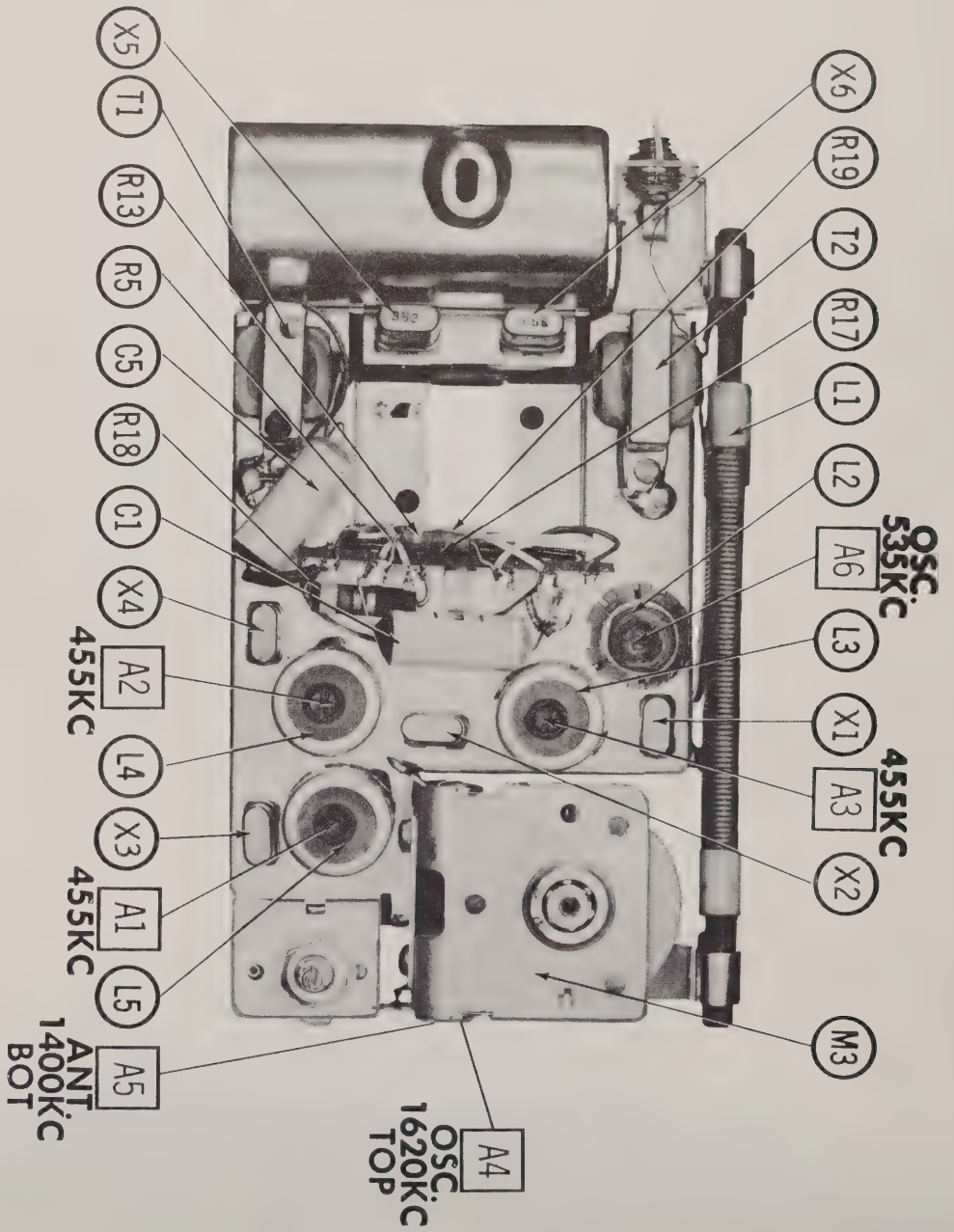
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R2	100K		27E104K-1/3	BTR-100K	
R3	220K		27E224M-1/3	BTR-220K	Note 1
R4	1500Ω		27E152K-1/3	BTR-1500	
R5	39K		27E393K-1/3	BTR-39K	
R6	220Ω		27E221K-1/3	BTR-220	Note 1
R7	220Ω		27E221K-1/3	BTR-220	
R8	4700Ω		27E472K-1/3	BTR-4700	
R9	5600Ω		27E562K-1/3	BTR-5600	
R10	1000Ω		27E102K-1/3	BTR-1000	
R11	330Ω		27E331K-1/3	BTR-330	
R12	6800Ω		27E682K-1/3	BTR-6800	
R13	3300Ω		27E332K-1/3	BTR-3300	
R14	5600Ω		27E562K-1/3	BTR-5600	
R15	2200Ω		27E222K-1/3	BTR-2200	
R16	470Ω		27E471K-1/3	BTR-470	
R17	100Ω		27E101K-1/3	BTR-100	Notes 2
R18	4.7Ω		27E1015-11	BW½-4.7	
R19	100Ω		27E101K-1/3	BTR-100	
R20	15K		27E153K-1/3	BTR-15K	Note 3
R21	15K		27E153K-1/3	BTR-15K	Note 3

Note 1. Not used in Chassis CR729BA.
Note 2. Chassis CR729BA use 56Ω (Part #27E560K-1/3).
Note 3. Not used in Chassis CR729AA.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Resistance PRI.	Resistance SEC.	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	245Ω	39.5Ω CT	22E115B				TR-4 ①		①Fabricate mounting.
	Turns Ratio 1.7: 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	650Ω	16Ω	22E116				TR-20 ①		①Fabricate mounting.

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA MAGNAVOX PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	2 3/4"	PM	16Ω	1E73			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	.1Ω	.8Ω	64E40				
L2	Osc. Coil	2.5Ω	6.8Ω*	20E1231				* Tapped ⓐ .3Ω
L3	1st. IF Trans.	1.4Ω	.6Ω	20E1229				
L4	2nd. IF Trans.	1.4Ω	.6Ω	20E1229				
L5	3rd. IF Trans.	1.1Ω	2Ω ■	20E1230				■ Tapped ⓐ .4Ω

BATTERIES

ITEM No.	VOLTAGE	MAGNAVOX PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	4V	530043-1	E233						

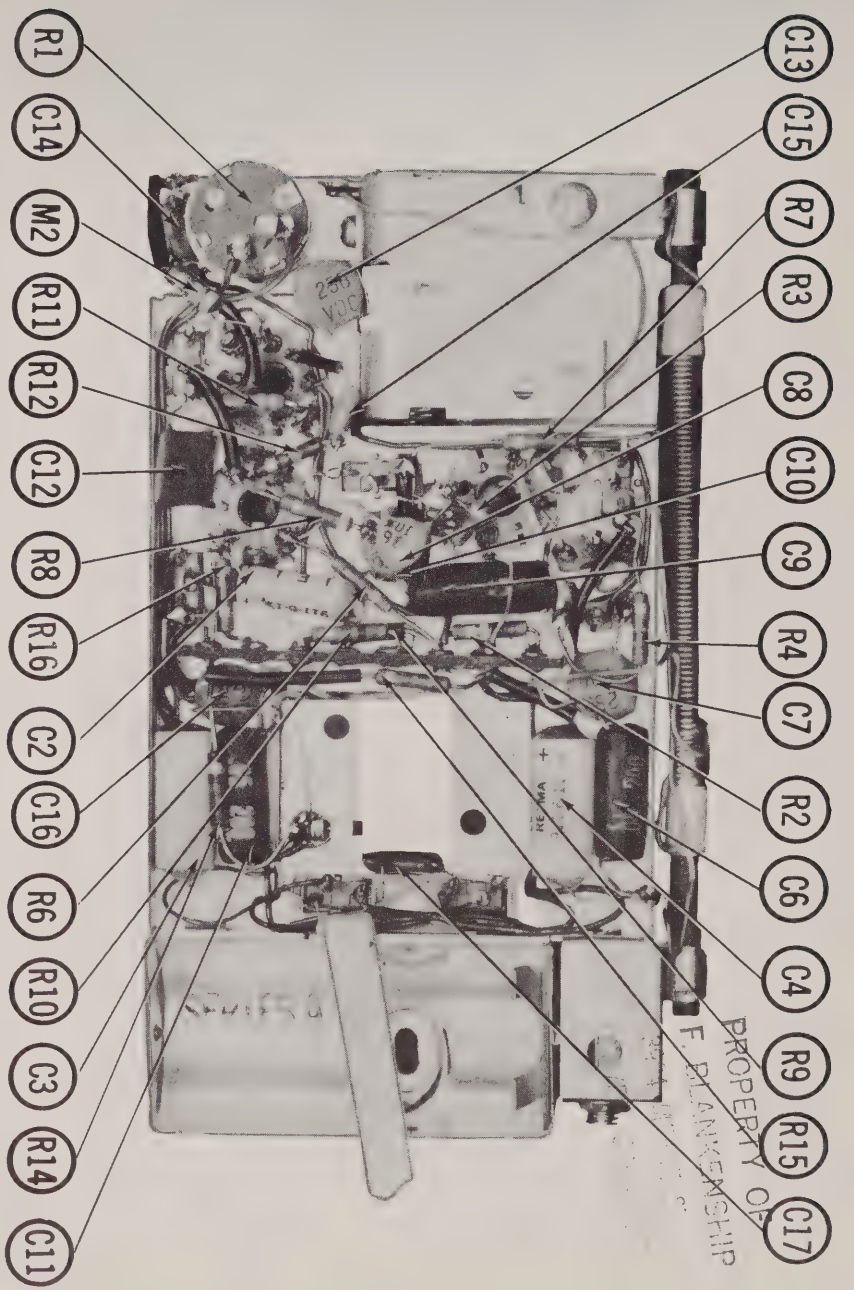
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MAGNAVOX PART No.	SYLVANIA PART No.	NOTES
M2	1N295	95E2	1N60	Audio Det. (Pigtail)

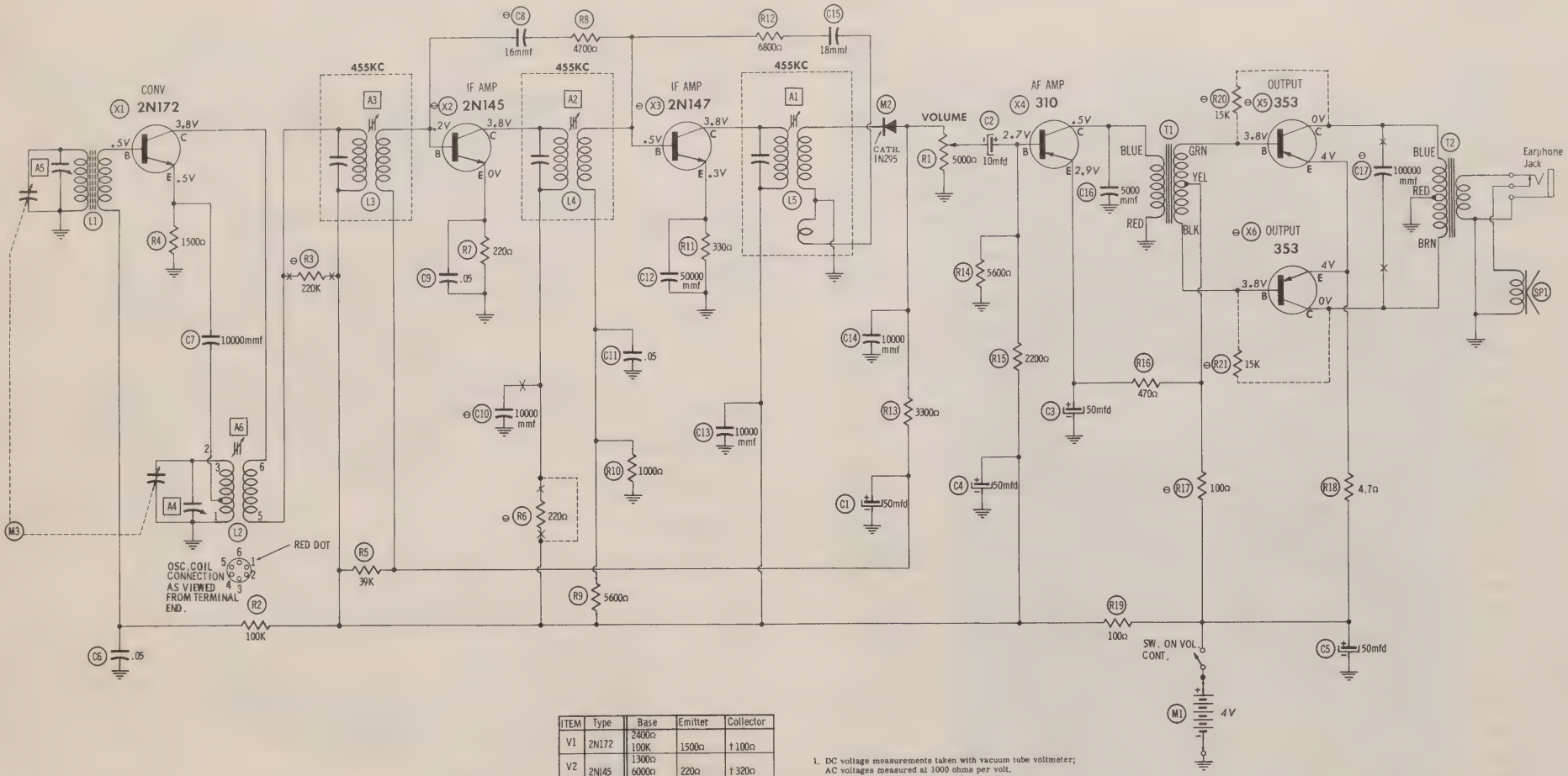
MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M3	Tuning Cap.	24E78	2 Gang (19-220MMF, 23-120MMF)
	Cabinet Front	20E1235-7	(Red) Includes jewel, grille and decorative strip
	Cabinet Front	20E1235-8	(Ivory) Includes jewel, grille and decorative strip
	Cabinet Front	23E1235-9	(Black) Includes jewel, grille and decorative strip
	Cabinet Back	7E543	Red
	Cabinet Back	7E543-2	Ivory
	Cabinet Back	7E543-3	Black
	Knob	37E117	On-off-volume
	Dial	37E118-2	Tuning

CHASSIS—BOTTOM VIEW



MAGNAVOX CHASSIS CR729AA



ITEM	Type	Base	Emitter	Collector
V1	2N172	2400Ω 100K	1500Ω	†100Ω
V2	2N145	1300Ω 6000Ω	220Ω	†320Ω
V3	2N147	800Ω	330Ω	†100Ω
V4	310	700Ω 2800Ω	†550Ω	200Ω
V5	353	†100Ω	†4.7Ω	10Ω
V6	353	†100Ω	†4.7Ω	10Ω

† MEASURED FROM POSITIVE SIDE OF C5.
DUAL READING INDICATES REVERSAL OF METER LEADS.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 19% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

MUNTZ
MODELS 621C, T, TS

PROPERTY OF
BLANKENSHIP
MEADE ST.
COLORADO

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MUNTZ MODEL 621T

TRADE NAME	Muntz Models 621C, 621T, 621TS
MANUFACTURER	Muntz TV Inc., 1000 Grey Ave., Evanston, Illinois
TYPE SET	Television
TUBES	Eleven
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1 Amp. @117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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MUNTZ
MODELS 621C, T, TS

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RETMA MEMBER

MUNTZ
MODELS 621C, T, TS

PROPERTY OF
L. F. BLANKENSHIP
3824 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from side panel of cabinet.

2. Remove 6 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 4 chassis mounting board bolts . Remove chassis with mounting board.

5. Remove 2 wing nuts. Remove speaker.

MODEL

621T

MUNTZ
MODELS 621C, T, TS

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control at the center of rotation and adjust the horizontal ringing coil (L19) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust discriminator secondary (L16) located on top of the chassis for maximum sound and MINIMUM buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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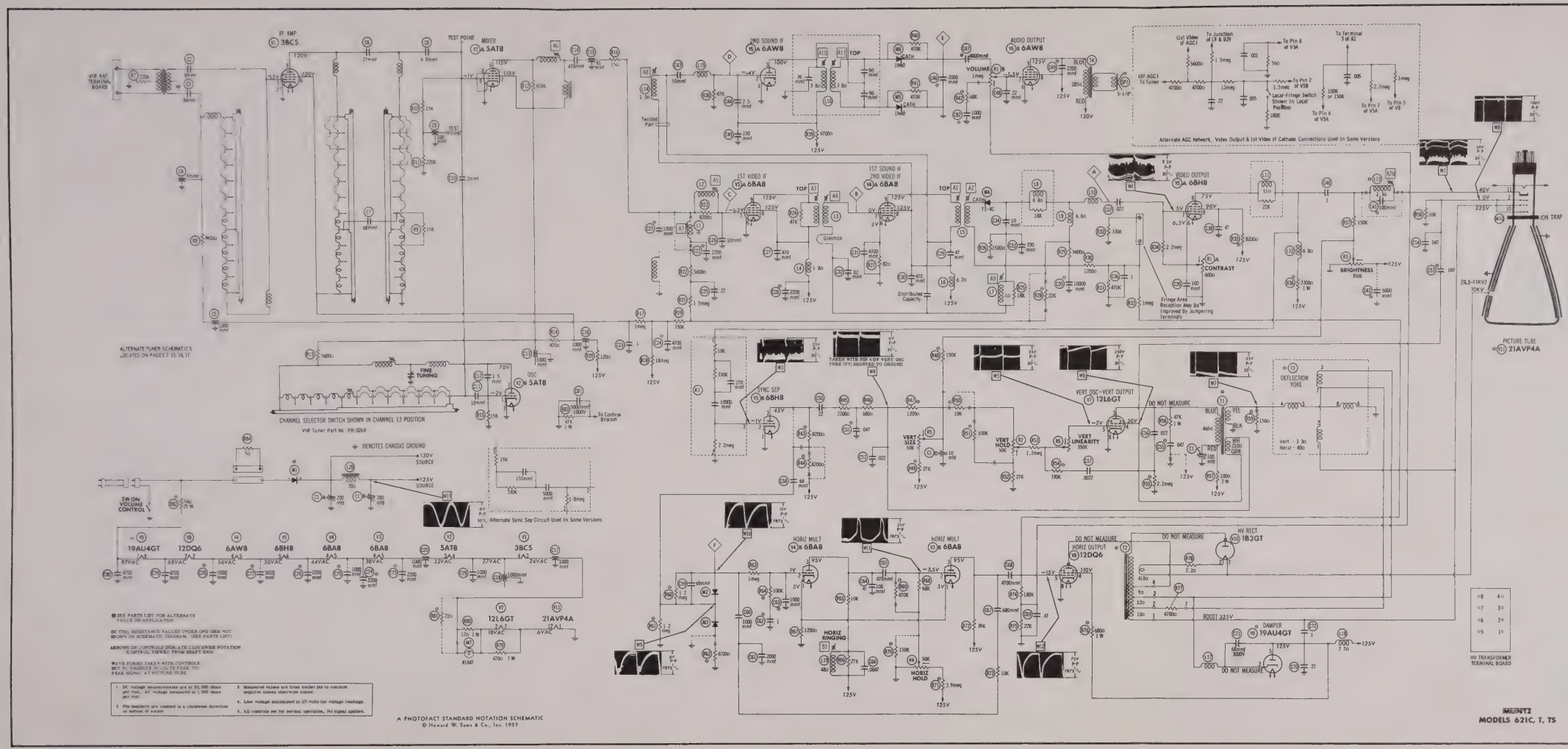
MUNTZ
MODELS 621C, T, TS
RF AMP V1 3BC5
MIXER V7A 5AT8
TEST POINT
2ND SOUND IF V6A 6AW8
AUDIO OUTPUT V6B 6AW8
VOLUME
1st Video IF AGC
To Junction of L9 & L29
To Pin 6 of V3A
To Terminal 3 of A1
IRF AGC To Tuner
To Pin 2 of V5B
To Pin 6 of V5A
To Pin 7 of V5A
To Pin 5 of V8
Local-Fringe Switch Shown In Local Position
Alternate AGC Network, Video Output & 1st Video IF Cathode Connections Used In Some Versions
1ST VIDEO IF V1A 6BA8
1ST SOUND IF 2ND VIDEO IF V4A 6BA8
VIDEO OUTPUT V5A 6BH8
CONTRAST
BRIGHTNESS
Fringe Area Reception May Be Improved By Jumpering Terminals
PICTURE TUBE V11 21AVP4A
ION TRAP
DEFLECTION YOKE
VHF ANT TERMINAL BOARD
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 7 15, 16 17
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part No. PR-5284
FINE TUNING
OSC V2A 5AT8
To Control Bracket
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
130V SOURCE
125V SOURCE
Alternate Sync Sep Circuit Used In Some Versions
SYNC SEP V5B 6BH8
TAKEN WITH PIN 4 OF VERT OSC TUBE (V7) SHORTED TO GROUND
VERT OSC-VERT OUTPUT V7 12L6GT
VERT SIZE
VERT HOLD
VERT LINEARITY
DO NOT MEASURE
HV RECT V10 1B3GT
HV TRANSFORMER TERMINAL BOARD
HORIZ MULT V4B 6BA8
HORIZ MULT V3 6BA8
HORIZ OUTPUT V8 12DQ6
HORIZ RINGING
HORIZ HOLD
BOOST 325V
DAMPER V9 19AU4GT
19AU4GT
12DQ6
6AW8
6BH8
6BA8
6BA8
5AT8
3BC5
12L6GT
21AVP4A
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION OF CONTROL VIEWED FROM SHAFT END
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE NO LOSS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2 Pin numbers are counted in a clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
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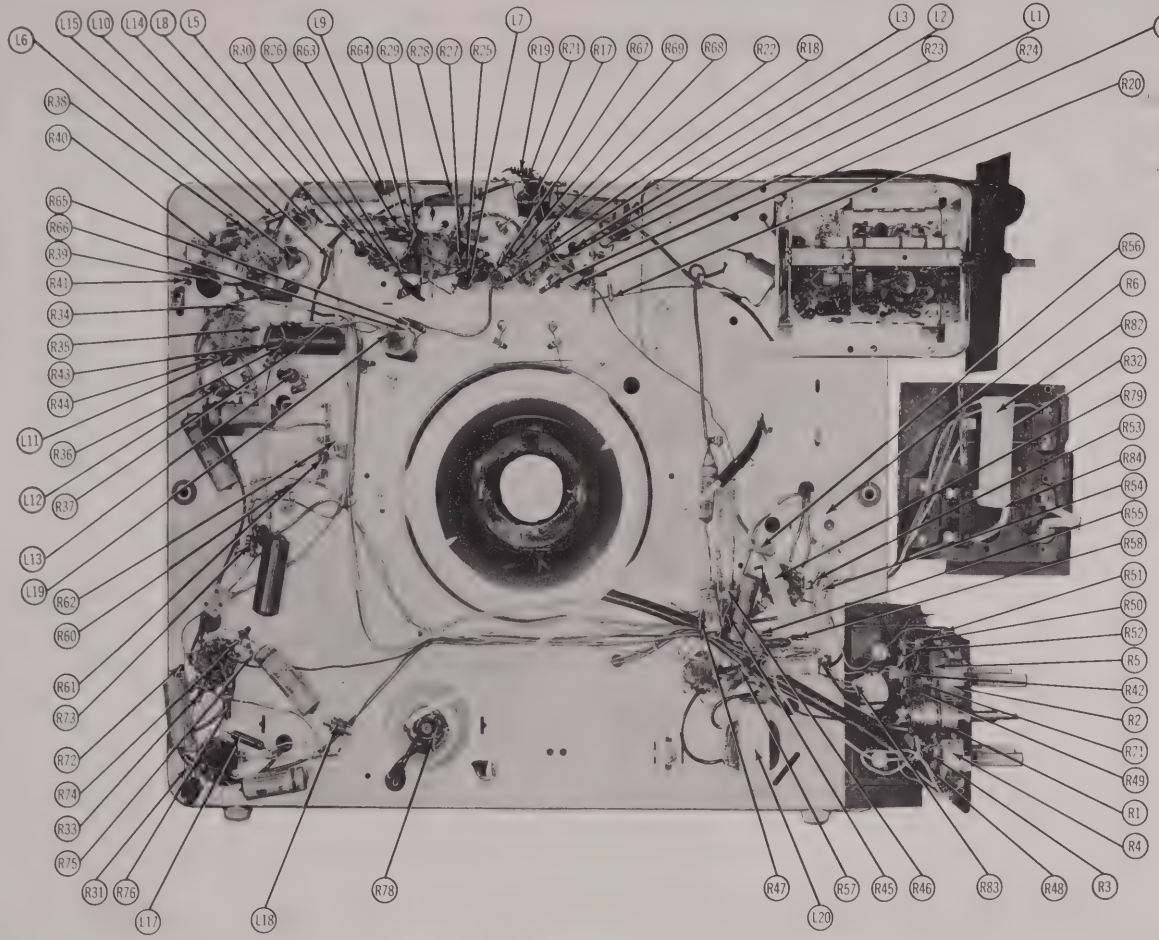
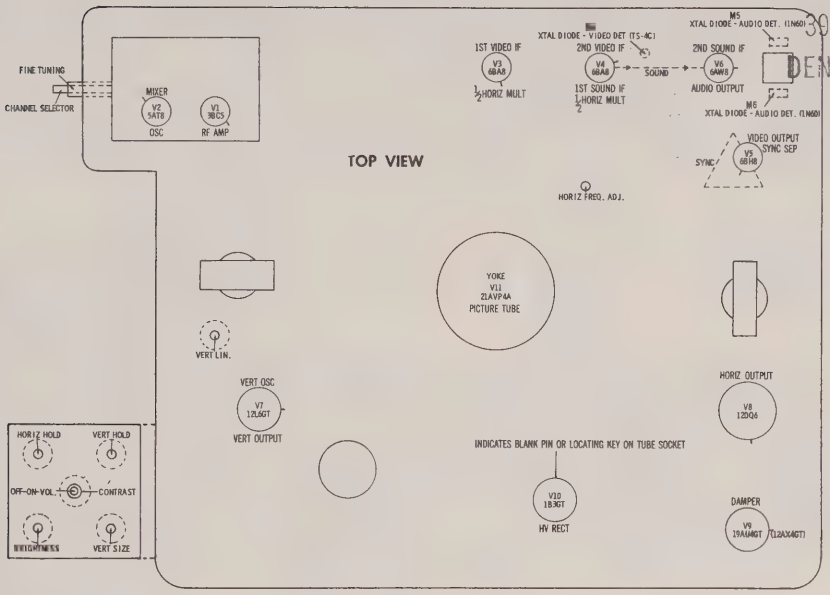


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PERTY OF
KENSHIP

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

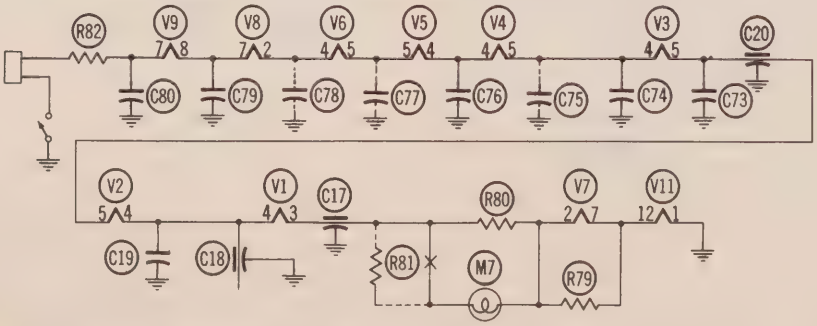
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifier (M1), Fuse Resistor (R84)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V5, V11
Has pic, no sound - V4, V6

SYNC FAILURE
No vert. sync - V5, V7
No horiz. sync - V3, V4, V5
No vert. or horiz. sync - V5

SWEEP FAILURE
No raster, has sound - V3, V4, V8, V9, V10, V11
No vertical deflection - V7
Poor vert. linearity or foldover - V7
Poor horiz. linearity or foldover - V3, V4, V8, V9
Narrow picture - V3, V4, V8, V9, V10, M1
Vert. off freq. - V5, V7
Horiz. off freq. - V3, V4, V5

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5.5 volt bias supply or battery to the ungrounded side of C5. Connect the positive lead to chassis. Adjust the one turn link on the second video IF coil (L3) tightly around the coil form midway between the primary and the secondary. Dress the orange gimmick wire on the first sound IF coil (L6) flat against the video detector shield to eliminate oscillation. Dress the green wire on L6 as close to the chassis as possible and away from the orange wire gimmick. Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to point (B). Low side to chassis.	44MC (10MC Swp)	44.25MC	Any non-interfering channel	Vert. Amp. thru 15K to point (A). Low side to chassis.	A1, A2	Adjust for maximum amplitude at 44.25MC marker as in Fig. 1.
2.	"	High side to point (C). Low side to chassis.	"	"	"	"	A3, A4	"
3.	"	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	"	41.25MC 42.5MC 43.0MC 44.75MC 45.75MC 47.25MC	"	"	A5, A6, A7	Adjust for waveform of maximum amplitude similar to Fig. 2. A6 affects the high frequency side of the curve. A5 affects the low frequency side and A7 affects the top of curve. A7 is adjusted by expanding and compressing coil turns.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection. If the waveform and marker position do not remain constant regardless of variation in the sweep amplitude or the waveform appears to have a sharp spike, vary the dress of the orange gimmick wire attached to the coil form of L6 in relation to the green lead from the grid of V4.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (470KC Swp)	4.5MC	Any	Vert. Amp. to point (D) thru 470K. Low side to chassis.	A8, A9	Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
5.	"	"	"	"	"	Vert. Amp. thru 470K to point (E). Low side to chassis.	A10, A11	Adjust A11 so that 4.5MC occurs at center of crossover lines as in Fig. 4. Adjust A10 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a TV station. Loosely couple the antenna to the antenna terminals so that the signal is weak. Adjust A8, A9 and A10 for maximum sound and MINIMUM hiss. Connect the antenna directly to the antenna terminals for a strong signal and adjust A11 for maximum sound.

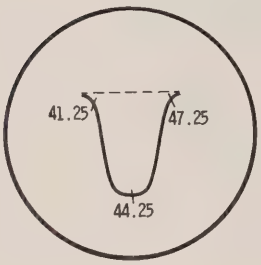


FIG. 1

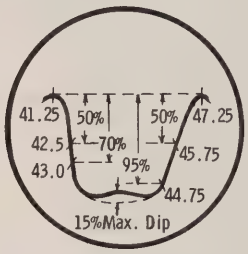


FIG. 2

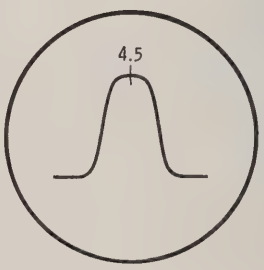


FIG. 3

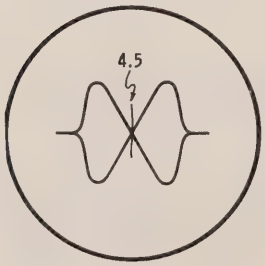


FIG. 4

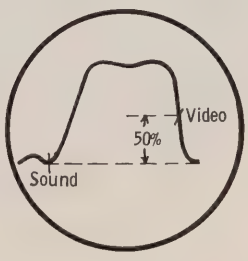


FIG. 5

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS #PR-0252 AND PR-0253

The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

VHF OSCILLATOR ALIGNMENT FOR TUNERS #PR-0251 AND PR-0254

Set the fine tuning to the center of its range. (On tuner #PR-0251 the red line on the wheel should be parallel to the chassis . On tuner #PR-0254 the slot in the center should be parallel to the chassis.) Turn the channel selector to the highest high band channel operating in your locality. Adjust A24 for best picture and sound. Turn the channel selector to the highest low band channel operating in the vicinity and adjust A25 for best picture and sound.

VHF RF AND UHF ALIGNMENT

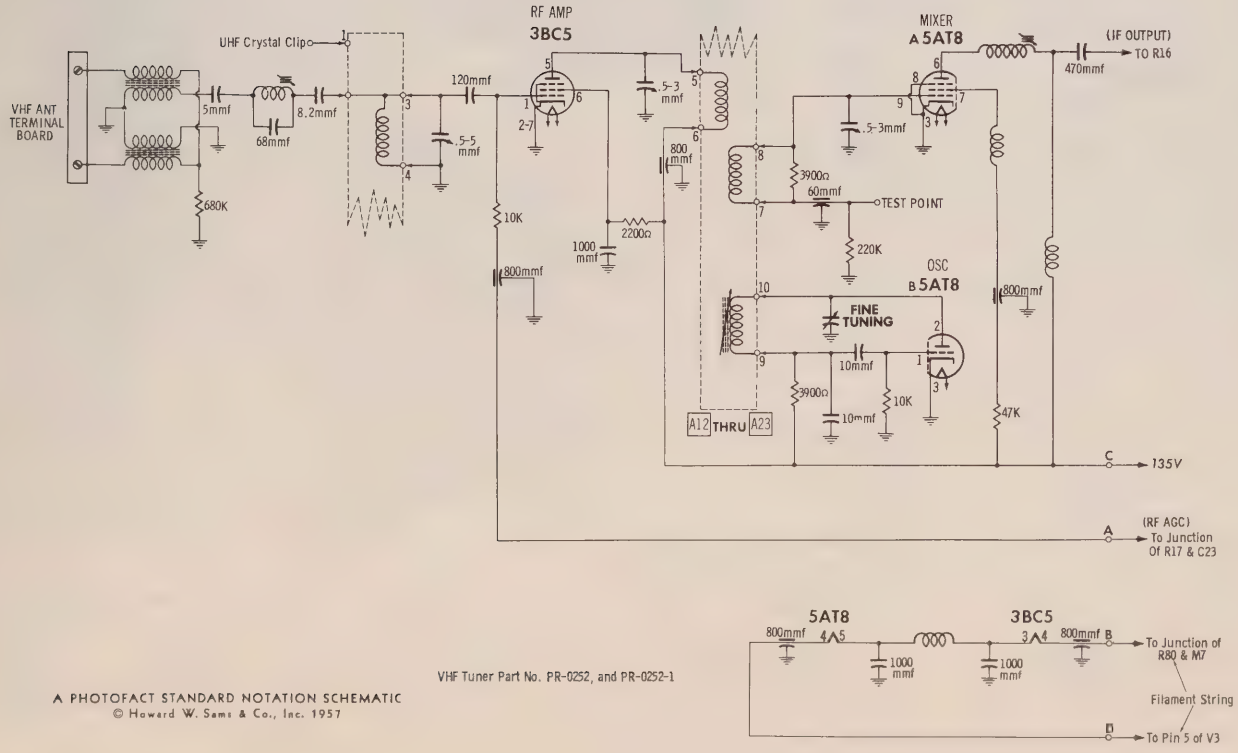
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

4.5MC TRAP ALIGNMENT

Adjust A26 for MINIMUM 4.5MC interference in picture.

VHF OSCILLATOR ALIGNMENT FOR TUNER #PR-0264

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



VHF Tuner Part No. PR-0252, and PR-0252-1

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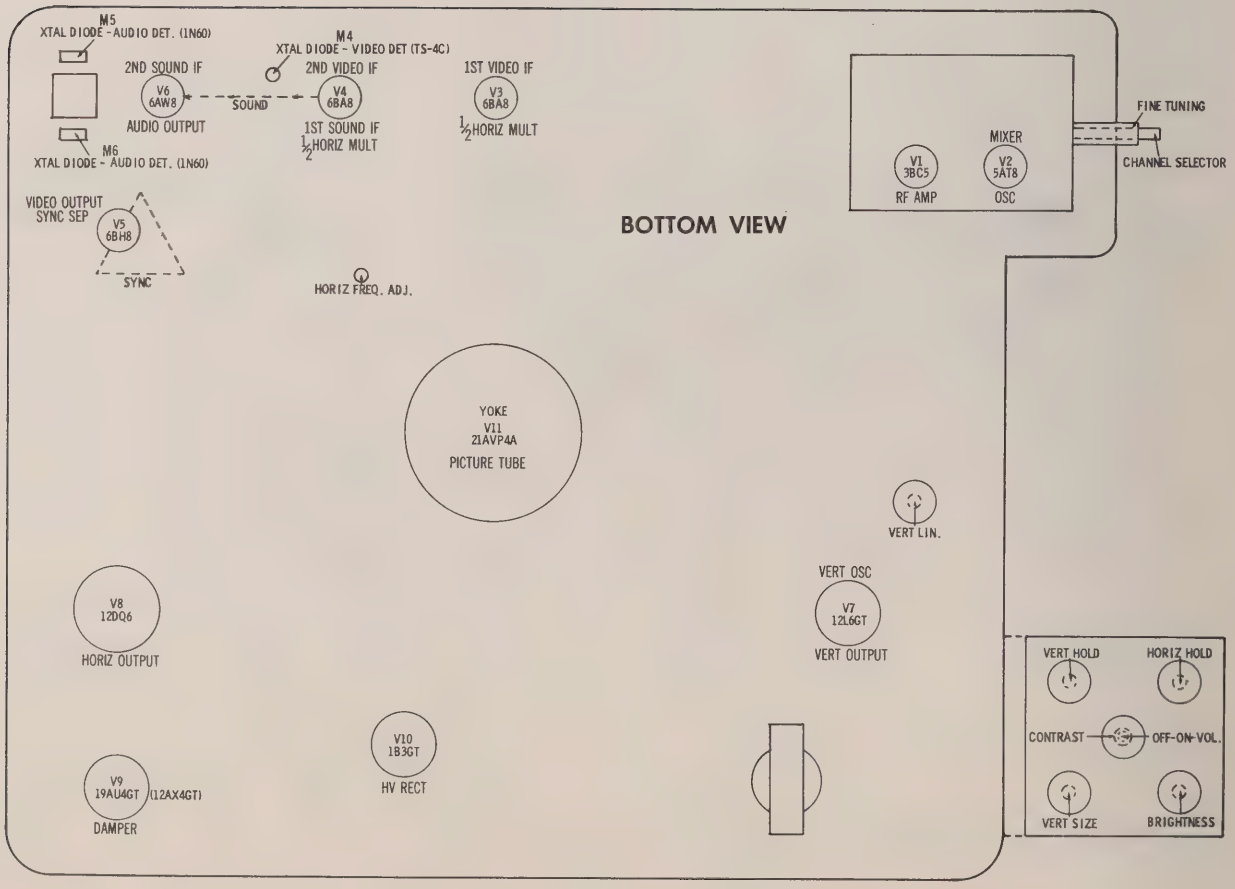
ALTERNATE VHF TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

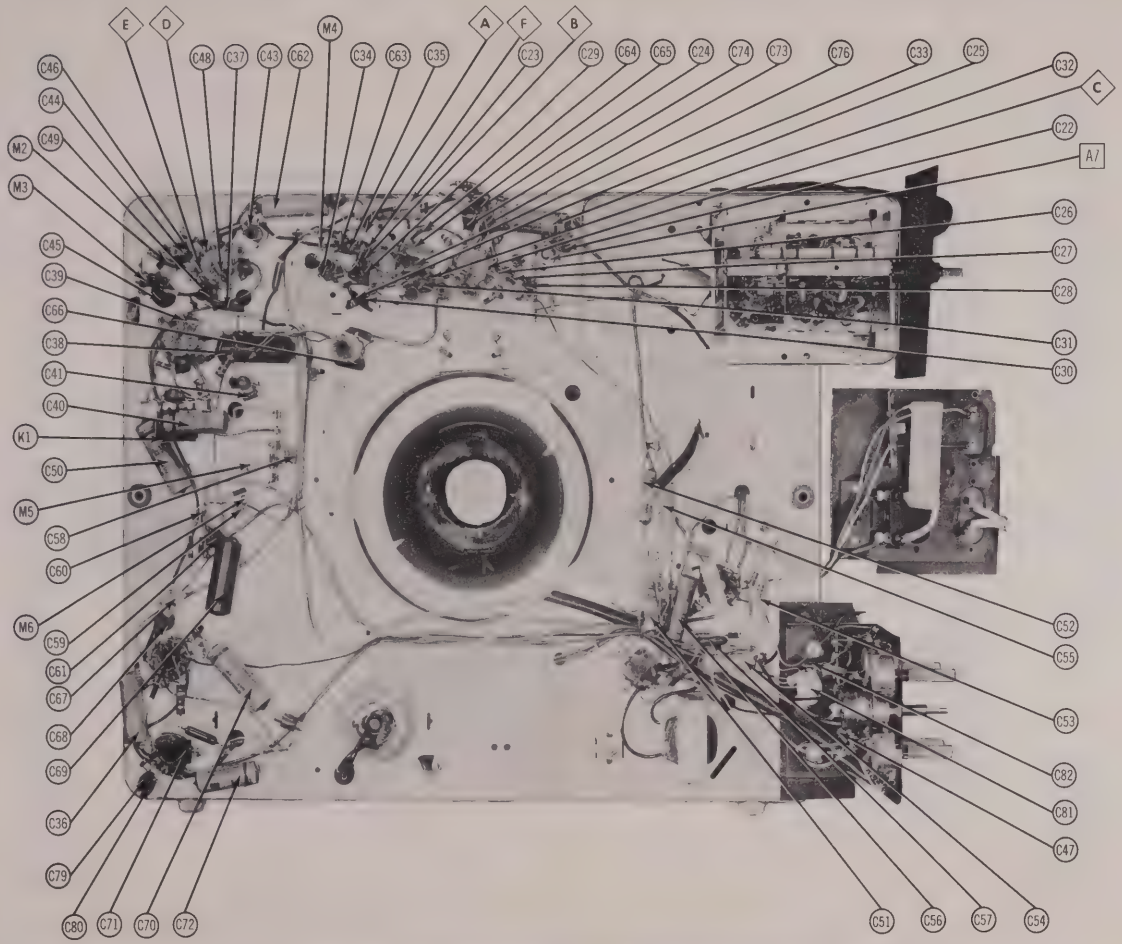
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1.5Meg	0Ω	10Ω	11Ω	†140Ω	†140Ω	0Ω		
V2	5AT8	15K	†6500Ω	0Ω	11Ω	12Ω	†500Ω	†500Ω	0Ω	235K
V3	6BA8	1200Ω	● 80K	†39K	13Ω	12Ω	0Ω	1.5Meg	†20Ω	†20Ω
V4	6BA8	1200Ω	3Meg	†10K	14Ω	13Ω	82Ω	1500Ω	†25Ω	†25Ω
V5	6BH8	0Ω	2.2Meg	†17K	14Ω	15Ω	● 300Ω	2.2Meg	†8200Ω	†3300Ω
V6	6AW8	0Ω	47K	†4700Ω	16Ω	15Ω	0Ω	● 350K	†20Ω	†285Ω
V7	12L6GT	NC	4Ω	†600Ω	●†30K	1.2Meg	TP	1.5Ω	0Ω	
V8	12DQ6	TP	16Ω	TP	†700Ω	170K	TP	18Ω	0Ω	TOP CAP *9Ω
V9	19AU4GT	TP	NC	INF	NC	†27Ω	TP	22Ω	18Ω	
V10	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP *420Ω
V11	21AVP4A	0Ω	10K	Pin 6 10K	Pin 10 *15Ω	Pin 11 ●†200K	Pin 12 1.5Ω			

† MEASURED FROM OUTPUT OF M1.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED FROM PIN 3 OF V9.
NC NO CONNECTION
TP TIE POINT



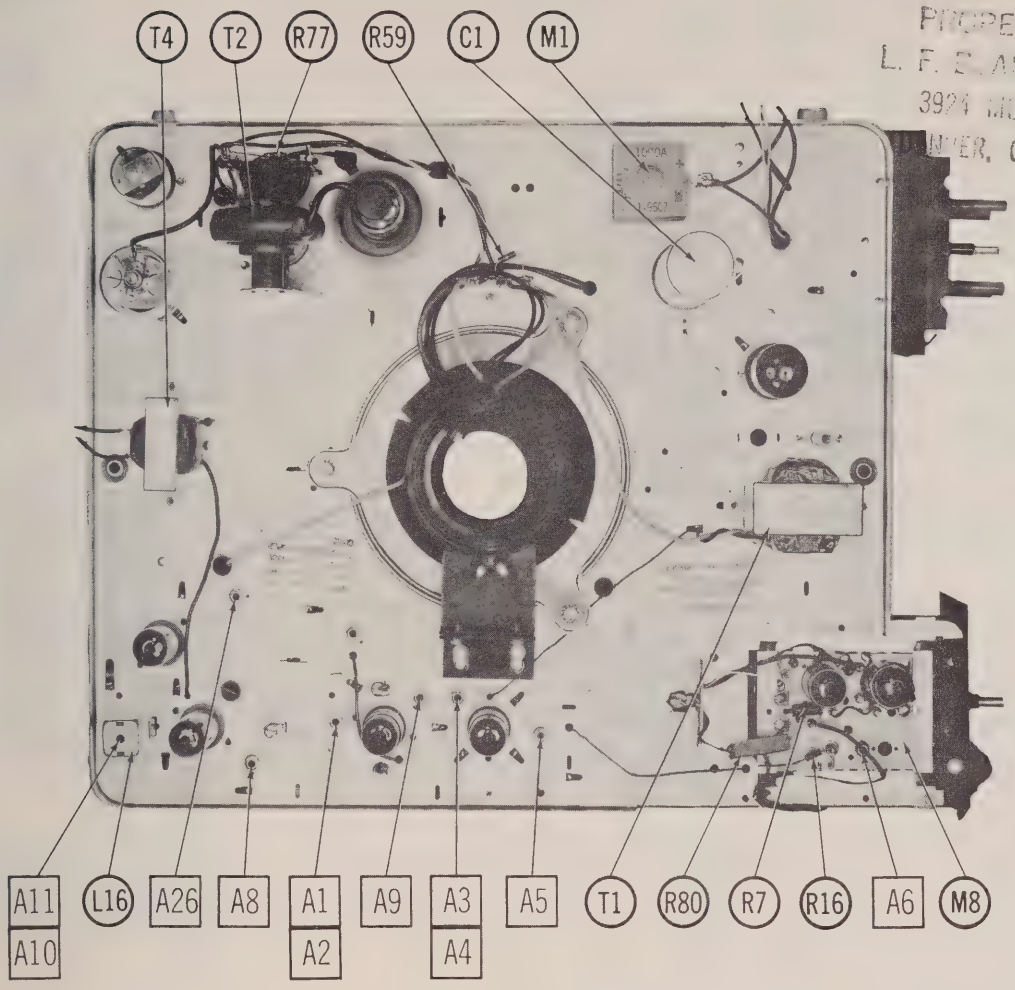
TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO

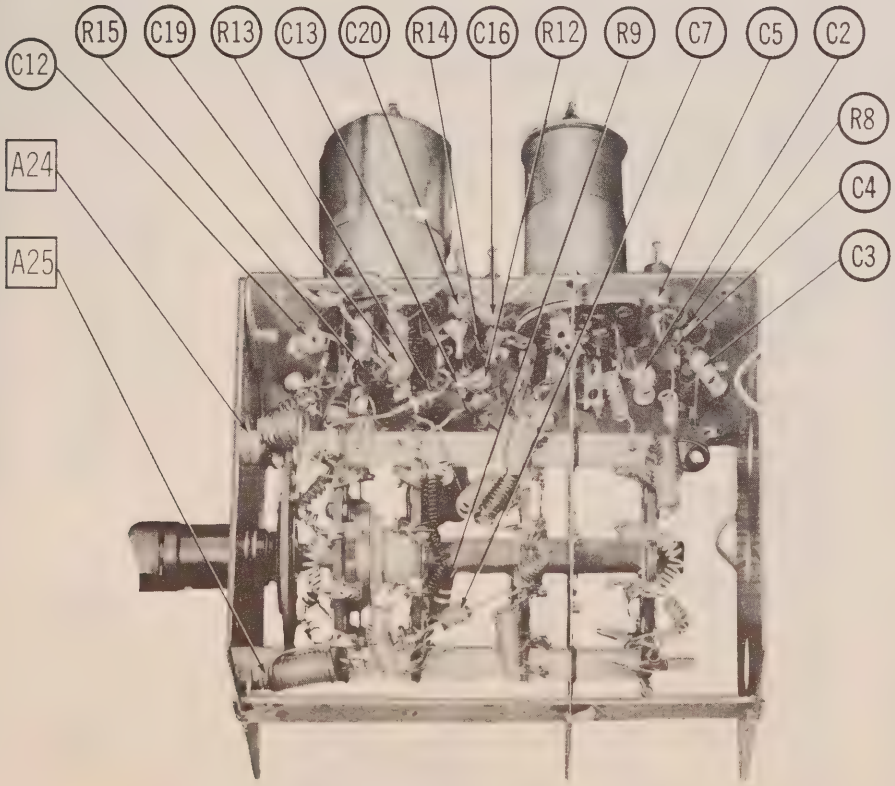


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. E. ANKENSHIP
3924 MILLE ST.
DENVER, COLORADO



CHASSIS TOP VIEW



RF TUNER-RIGHT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp. Mixer-Osc.	3BC5	
V2	1st Video IF Amp. - Horiz. Mult.	5AT8	
V4	2nd Video IF Amp. - 1st Sound IF Amp. - Horiz. Mult.	6BA8	
V5	Video Output - Sync Separator	6BH8	
V6	2nd sound IF Amp. - Audio Output	6AW8	
V7	Vert. Osc. Vert. Output	12L6GT	
V8	Horiz. Output	12DQ6	
V9	Damper	1BA4GT	Note 1
V10	HV Rectifier	1B3GT	

Note 1 1BA4GT used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: MUNTZ PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	NOTES
V11	21AVP4A ①	21AVP4A ①	21AVP4A ①	21AVP4A/B ①	① Aluminized ② Silver Screen "69" ③ Used in models 63IT, 63IC. ④ Used in model 63ITS.
	21AUP4A ②	21AUP4A ②	21AUP4A ②		
			21AUP4A ③	21AUP4A/B ②	
	21XP4 ③	21XP4	21XP4A ②	21XP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	MUNTZ PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1A	●200	150	CE-0042	AFH4-258-95				FD-095 FMT-339	R2326*	
B	●200	150								
C	●400	150								
D	10	75								

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	MUNTZ PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C3	8					Z015				
C4	8					Z015				
C5	1000									
C6	27									
C7	68				TCZ-R68	TZ02	TCO-.68			
C8	6.8			NPO-6S6.8	TCZ-6S8	Z013	TCO-6.8	ZT-5S68	5TCCB-V68	
C9	100									
C10	3					Z005				
C11	10			NPO-0S10	TCZ-10	Z016	TCO-10	ZT-541	5TCC-Q1	
C12	1.5									
C13	1000									
C14	470			DI-00047	DD-471	G060	ED-470	VC-5347	5GA-T47	
C15	91									
C16	1000									
C17	1000									
C18	1000									
C19	1000			DI-001	DD-102	G089	ED-1000	UC-521	5GA-D1	
C20	1000									
C21	1000		CC-0131	DI-001	DD-102	G089	ED-1000	UC-521	5GA-D1	Note 1
C22	3300			P388N-33	DD-332	G073	ED-3300	UC-5233	5GA-D32	Note 1
C23	.1	200	CP-0026	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C24	4700		CC-0060	DPD-0047	DD-472	K079	ED-0047	CSDS-25	5MX-D5	Note 9
C25	23	200	CP-0055	P288N-32		CUB2P32	GEM-2032	2TM-P22		
C26	10		CC-0033							
C27	470		DI-00047	DD-471	G060	ED-470	VC-5347	5GA-T47		
C28	2200			DPD-0022	DD-222	K073	ED-0022	UC-5232	5GA-D22	Note 4
C29	47		CC-0156	DTC-47	DD-470	TC7-47	ED-5047	5TCU-Q47	5TCC-Q47	
C30	470		CC-0159	DI-00047	DD-471	G060	ED-470	VC-5347	5GA-T47	
C31	4700		CC-0060	DPD-0047	DD-472	K079	ED-0047	DC525	5MX-D47	
C32	33		CC-0157		TCN-33		TCT-33			
C33	330		CC-0160			TH34				
C34	10		CC-0164	NPO-S10	TCZ-10	Z008	TCO-10	ZT-541	5TCC-Q1	
C35	10000		CC-0161	BPD-01	DD-103	ED-03	ED-01	DC511	5MX-S1	Note 3
C36	.001	200	CP-0028	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C37	.022	200	CP-0032	BPD-03	DF-303	CUB4S23	ED-023	GEM-4123	2TM-S23	
C38	.47	200	CP-0045	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C39	100		CC-0148	NPO-D100	DD-101	TC7-47	ED-100	DC511	5TCC-T1	
C40	.1	400	CP-0034	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C41	100		CC-0148	NPO-S100	DD-101	TC5-30	ED-100	DC-521	5TCC-T1	Note 1
C42	5000		CC-0090	BPD-005	DD-502	K080	ED-005	DC525	5MX-D51	Note 1
C43	56		CC-0154	NPO-S150	TCE-50	Z034	TCO-150	ZT-546	5TCC-Q5	
C44	7.5		CC-0153							
C45	150		CC-0166	NT50-S150	TCH-150	H046	TCT-150		5TCU-T15	Note 3
C46	5000		CC-0090	BPD-005	DD-502	K080	ED-005	DC525	5MX-D51	Note 3
C47	4000		CC-0088	BPD-004	DD-402	E078	ED-004	UC-524	5MX-D4	Note 3
C48	2200		CC-0086	BPD-022	DD-222	GP-23	ED-022	UC-5222	5GA-D22	
C49	2200			BPD-0223	DD-S33	K073	ED-0022	UC-5232	5GA-D22	Note 4
C50	.22	200	CP-0065	P288N-22		CUB2P22		GEM-2023	2TM-P22	
C51	.047	200	CP-0068	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C52	.022	200	CP-0063	BPD-03	DF-303	CUB4S23	ED-02	GEM-4123	2TM-S23	
C53	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	Note 10
C54	.047	200	CP-0066	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C55	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	Note 6
C56	.022	600	CP-0063	BPD-03	DF-303	CUB6S23	ED-02	GEM-6123	6TM-S23	
C57	.0022	600	CPM-0100	BPD-0023	DE-233	CUB6D22	ED-0200	GEM-6223	6TM-D22	
C58	.68		CC-0018	NPO-6S68	TCE-68	Z038	TCO-68		5TCC-Q68	
C59	.68		CC-0049	NPO-6S68	TCE-68	Z038	TCO-68		5TCC-Q68	
C60	1000		CC-0017	DI-001	DD-102	G089	ED-1000	UC-521	5GA-D1	
C61	3000		CC-0180	DI-003	DD-302	K073	ED-002	DC522	5GA-D3	
C62	.1	200	CP-0068	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	Note 7
C63	1000		CC-0017	BPD-001	DD-102	ED89	ED-001	DC521	5MX-D1	Note 8
C64	100		CC-0048	NPO-S100	DD-101	T230	ED-100	MCB235	5TCC-T1	Note 9
C65	470	500	CM-0048	1484-00047	DD-471	SBZY47	ED-470		M3-347	
C66	.0047	600	CPM-0113	1484-00047		UR5D47			M5-247	
C67	680	500	CM-0049	1484-00068	DE-681	UR5T68			M5-368	
C68	4700		CP-0060	BPD-0047	DD-471	E079	ED-0047	DC525	5MX-D47	
C69	.47	200	CP-0065	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C70	.22	200	CP-0065	P288M-33		CUB2P22		GEM-2022	2TM-P22	
C71	68	3000	CC-0234	HVD-30-68	DD30-680	V3Q68	ED3-68	DC30468	30GA-Q68	
C72	1.1	400	CP-0054	P488M-1		CUB4P1		GEM-401	4TM-P1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: MUNTZ PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C73	2200			BPD-0022	D6-222	K073	ED-0033	DC523	5MX-D22	Note 4
C74	2200			BPD-0022	D6-222	K073	ED-0033	DC523	5MX-D22	Note 4
C75	1000		CC-0131	BPD-001	DD-102	K089	ED-001	DC521	5MX-D1	Note 4
C76	2200			BPD-0023	D6-222	K073	ED-0033	DC523	5MX-D22	Note 4
C77	5000		CC-0080	BPD-005	DD-502	K080	ED-005	DC525	5MX-D5	Note 1
C78	5000		CC-0090	BPD-005	DD-502	K080	ED-005	DC525	5MX-D5	Note 1
C79	4700		CC-0060	BPD-0047	DD-472	K079	ED-0047	DC525	5MX-D47	
C80	4700		CC-0060	BPD-0047	DD-472	K079	ED-0047	DC525	5MX-D47	
C81	5000	1000	CC-0133	HVD-15-4700	DD16-502	VD47	ND15-4700	GEM-1025	10MX-D47	
C82	1000		CC-0131	BPD-001	DD-102	K089	ED-001	DC521	5MX-D1	Note 1

Note 1: Not used in some versions.
Note 2: Model 63IT8 uses 1000MMF in this application. (part #CC-0131).
Note 3: Some versions may use 8000MMF in this application. (part #CC-0080).
Note 4: Some versions may use 3000MMF in this application. (part #CC-0117).
Note 5: Some versions may use 10000MMF in this application. (Part #CC-0161).
Note 6: Some versions may use .01MFD in this application. (Part #CP-0018).
Note 7: Some versions may use .047MFD in this application. (Part #CP-0068)
Note 8: Some versions may use 3000MMF in this application. (Part #CC-0090).
Note 9: Some versions may use 68MMF in this application. (Part #CM-0052).
Note 10: Some versions may use .033MFD in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MUNTZ PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	600Ω	1	VC0058	F12			UF52R	Contrast (Panel) - Note 1
B	1Meg	1	Not Req.	R2-56			UB1F25	Volume (Rear)
C	Switch		Not Req.	KB-1			US-28	Attach to R1B
R2A	50K	1	BX-31	BX-31	A47-50K-S	QU-123	PTA54L	Vertical Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	SQ	Not Req.	Attach to R2A
R3A	350K	1	VC0055	BX-59	A47-500K-S	QU-132	SU-50	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	SQ	Not Req.	Attach to R3A
R4A	50K	1	VC0051	BX-31	A47-50K-S	QU-122	PTA54L	Horizontal Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	SQ	Not Req.	Attach to R4A
R5A	50K	1	VC005I	BX-31	A47-50K-S	QU-122	PTA54L	Vertical Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	SQ	Not Req.	Attach to R5A
R6A	150K	1	VC0066	BX-51	A47-500K-S	BU-132	BU-39	Vertical Linearity - Note 2
B	Shaft		Not Req.	Not Req.	FKS-1/4	TM2-KIT	Not Req.	Attach to R6A

Note 1: Alternate part #VC0056 used in some versions.
Note 2: Alternate part #VC0055 used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MUNTZ PART No	IRC PART No	NOTES
R7	220K		BTS-220K	RC-1201-18	
R8	3300Ω		BTS-3300	RC-1201-18	Note 4
R9	15K		BTS-15K	RC-1503-18	Note 5
R10	15K		BTS-15K	RC-1503-18	Note 5
R11	330K		BTS-330K	RC-1003-18	Note 1
R12	470K		RC-4703-18	RC-1003-18	Note 1
R13	5600Ω		RC-5601-18	BTS-5600	
R14	470Ω		RC-4703-18	BTS-470	
R15	15K			BTS-15K	
R16	15Ω			BTS-15Meg	
R17	1Meg		RC-1004-18	BTS-1Meg	
R18	15Meg			BTS-15Meg	
R19	330K			BTS-330K	
R20	130Ω			BTS-130	
R21	5.5Meg				
R23	5600Ω		RC-5601-18		
R23	6900Ω		RC-6901-18		
R24	47K		RC-4703-18	BTS-47K	
R25	18K		RC-1803-18		
R26	1900Ω		RC-1901-18		
R27	63Ω		RC-062-18	BTS-63	
R28	33K		RC-2203-18	BTS-33K	Note 1
R29	560Ω		RC-5601-18	BTS-5600	
R30	1200Ω		RC-1201-18	BTS-1300	
R31	470K		RC-4703-18	BTS-470K	
R32	330K		RC-3303-18	BTS-330K	
R33	1Meg		RC-1004-18	BTS-1Meg	
R34	2.5Meg		RC-2204-18	BTS-2.5Meg	Note 2
R35	6200Ω		RC-6201-18	BTS-6200	Note 2
R36	3300Ω	1		BTA-3300	Note 2
R37	150K		RC-1503-18	BTS-150K	Note 5
R38	47K		RC-4703-18	BTS-47K	
R39	4700Ω		RC-4701-18	BTS-4700	
R40	470K		RC-4703-18	BTS-470K	
R41	470K		RC-4703-18	BTS-470K	
R42	68K		RC-6803-18	BTS-68K	Note 1
R43	8200Ω		RC-8201-18	BTS-8200	Note 2
R44	8200Ω		RC-8201-18	BTS-8200	
R45	2200Ω		RC-2201-18	BTS-2200	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MUNTZ PART No	IRC PART No	NOTES
R48	680Ω		RC-6801-18	BTS-680	
R47	1300Ω		RC-1301-18	BTS-1300	Note 4
R48	150K		RC-1503-18	BTS-150K	Note 5
R49	27K		RC-2703-18	BTS-27K	Note 6
R50	10K		RC-1003-18	BTS-10K	Note 1
R51	100K		RC-1003-18	BTS-100K	Note 1
R52	27K		RC-2703-18	BTS-27K	
R53	1.2Meg		RC-1204-18	BTS-1.2Meg	
R54	330K		RC-3303-18	BTS-330K	Note 7
R55	2.2Meg		RC-2204-18	BTS-2.2Meg	Note 8
R56	47K	1	RC-4702-11	BTA-47K	
R57	100Ω	2	RC-002-13	BTB-100	
R58	68K		RC-6803-18	BTS-68K	
R59	470K		RC-4703-18	BTS-470K	
R60	150K		RC-1503-18		Note 1
R61	3.6Meg				Note 10
R62	39K		RC-3903-18		
R63	10K		RC-1003-18		
R64	180K		RC-1803-18		
R65	33K		RC-3303-18		
R66	6800	1		BTA-680	Note 12
R67	47000		RC-4701-18	BTS-4700	
R68	2.2Ω		RW-002-18	BW1-2.2	
R69	470Ω	7	RW-470-17		
R70	470Ω	7	RW-470-17		
R71	22Ω		RC-022-18	BTS-22	Note 11
R72	5MEG	25	5MEG-50	5IDA-50	Note 11
R73	47K	1	RC-4703-13	BTA-47K	
R74	5Ω		RW-005-13	FR5-5	

Note 1: Not used in some versions.
Note 2: Some versions use 10K (Ref #RC-1002-18) in this application.
Note 3: Some versions use 5600Ω, 2W (Part #RC-5601-13) in this application.
Note 4: Some versions use 1500Ω (Part #RC-1501-18) in this application.
Note 5: Some versions use 100K (Part #RC-1003-18) in this application.
Note 6: Some versions use 39K (Part #RC-3902-18) in this application.
Note 7: Some versions use 390K (Part #RC-3903-18) in this application.
Note 8: Some versions use 1.8Meg (Part #RC-1804-18) in this application.
Note 9: Some versions use 68K (Part #RC-6802-18) in this application.
Note 10: Some versions use 3.2Meg (Part #RC-3204-18) in this application.
Note 11: Some versions use 56Ω, 25W (Part #RW-0043) in this application.
Note 12: Some versions use 1200Ω, 1W (Part #RC-1001-13) in this application.
Note 13: Some versions use 470K (Part #RC-4703-18) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: MUNTZ PART No.	Hallerdorn PART No	Merit PART No	RCA TYPE No	Rem PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Osc. & Vert. Output Trans.	TO-0045 ① TO-0051 ②							
T2	Horiz. Output Trans.	TO-0080	FB41P1* ③	HVO-36* ③	230T1* ③	RO94* ③	A-6291*	FLY-1P1 ③	TO-50* ③
T3A	Yoke-Horiz(63MIS)	LC-0052	DF803 ③	MDF-76 ③	21ADI ③		A-6291 ③	DY-16A ③	Y-20 ③
T3B	Vert(3.6MH)	LC-0099 ④				YT0928/2 ③		V-U ③	
		PR-0234 ③							

① Used in chassis below serial no. 159000.
② Used in chassis above serial no. 159000.
③ Drill new mounting hole(s).
Alternate Munts part number.
Yoke rear cover and centering device.
Use original rear cover and centering device.
Use original yoke damping network.
† This part may be superceded by Parts Manufacturer's introduction of special coil for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Hallerdorn Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	9	9	9	7	9	8	
	3	7	7	7	4	7	7	
	2	N.C. See Note ③	N.C. See Note ③	N.C. See Note ③	N.C. See Note ③	N.C. See Note ③	N.C. See Note ③	N.C. See Note ③
	1	1	1	1	1	1	1	
Special Notes		③	③	③	③	③	③	③

③ Install new damping network consisting of 50-100MMF ① 2KV, and 1000Ω ½ watt connected in series across horiz. yoke terms #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MUNTZ PART No.	Hallerdorn PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T4	6K	3-4Ω	TO-0049-1	21007	A-3019	A-3077 ①	26S49	S-5Z	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: MUNTZ PART No	QUAM PART No.	RCA TYPE No	NOTES
SP1	5 1/4	PM	3-4Ω	8K-0035-①	53A1	21TS1	① Used in model 62IT.
	6"	PM		8K-0032-②			② Used in model 63IC.
	4"	PM		8K-0022-③			③ Used in model 62ITS.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Coupling Coil	0Ω						Note 1
L2	1st Video IF	0Ω		LC-0067				
L3	2nd Video IF	.1Ω	.1Ω	LC-0068				
L4	RF Choke	1.8Ω		LC-0094				2.2 Microhenries; ENC part #CLA.
L5	3rd Video IF	.3Ω	.3Ω	LC-0090				
L6	Shunt Peaking Coil	5.2Ω		LC-0057-10	10-1300	TV-1EL	6177	100 Microhenries
L7	1st Sound IF	1Ω		LC-0095				
L8	Series Peaking Coil	6.8Ω		LC-0057-11	10-4400*		6154*	390 Microhenries; Wound on 10K resistor
L9	Shunt Peaking Coil	6.8Ω		LC-0057-13	10-3500		6138	470 Microhenries
L10	Shunt Peaking Coil	.8Ω		LC-0091				4.7 Microhenries
L11	Series Peaking Coil	11Ω		LC-0057-9	10-3300a		6133a	330 Microhenries; Wound on 22K resistor
L12	Shunt Peaking Coil	6.8Ω		LC-0057-8	10-3800		6140	560 Microhenries
L13	A.M.C. Trap	1.3Ω						Note 1
L14	2nd Sound IF	1.3Ω		LC-0096-1				
L15	RF Coil	6Ω		LC-0081				4.7 Microhenries
L16	Discriminator	3.8Ω	3.8Ω	LC-0076				
L17	RF Choke	.9Ω		LC-0092				
L18	RF Choke	5.7Ω		LC-0097				2 Millihenries

* Parallel with 18K resistor.
a Parallel with 22K resistor.
Note 1: Not used in some versions.

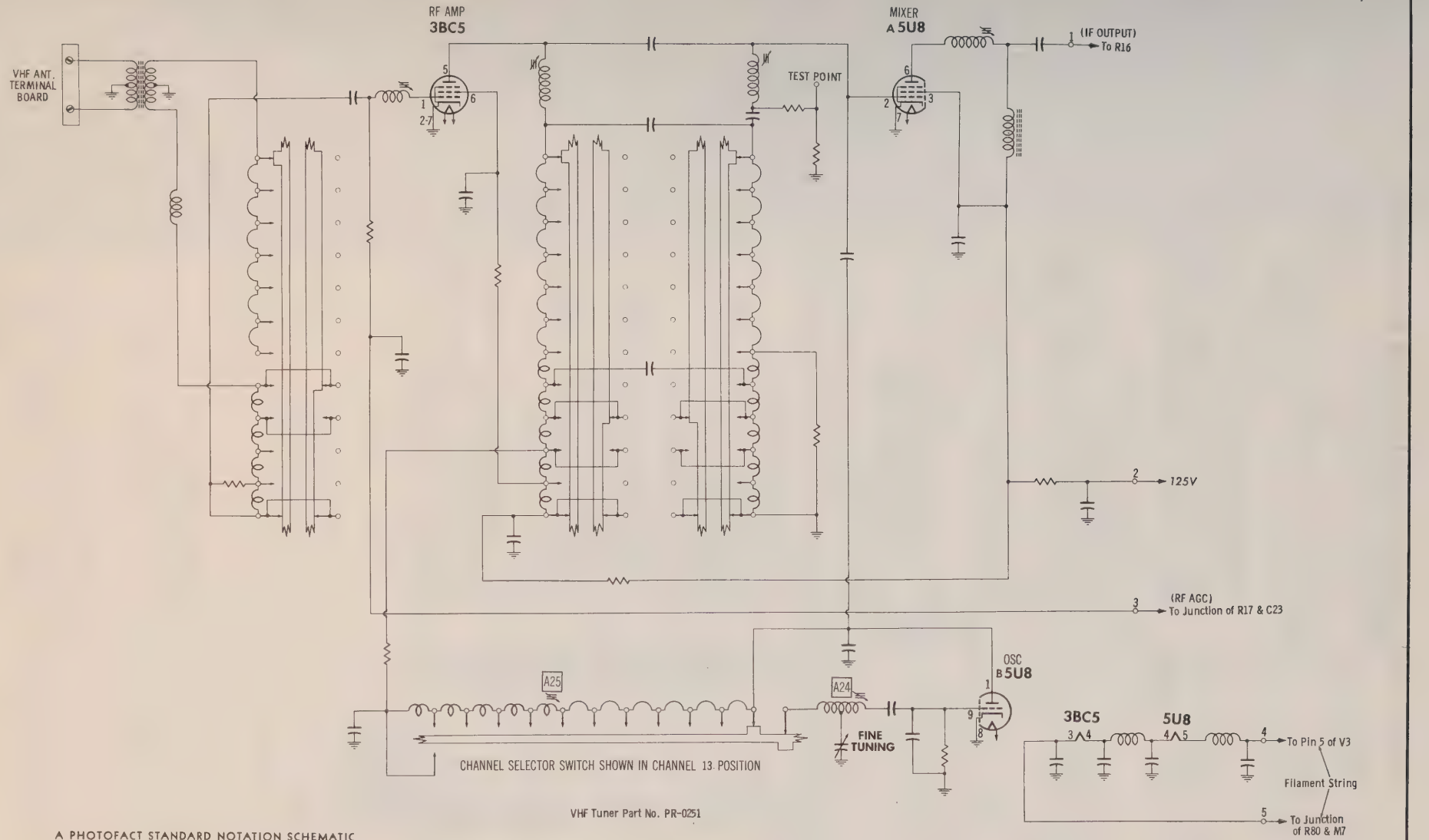
TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Rem PART No.	Thordarson PART No.	NOTES
L19	43Ω		LO-0077	18-1578	TV-163	6210			8S-5	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~/~	REPLACEMENT DATA: MUNTZ PART No.	Hallerdorn PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	.190A	20Ω	.75HY	LC-0081	C6041 ①		C-2328 ①		

① Drill one new mounting hole.



VHF Tuner Part No. PR-0251

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ALTERNATE VHF TUNER SCHEMATIC

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MUNTZ PART No.	REPLACEMENT DATA
K1	Sync Couplate	10K, 330K, 2. 2Meg, 270MMF, 10000MMF.	CC-0161	Aerovox PA531 Centralab Cornell-Dubilier Erie Sprague

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MUNTZ PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.230A	SR-0005 ① SR-0007 ②	1236AH	MR300	6S300	6Q4	300	① Used in models 621T, 621C ② Used in model 621TS.

SELENIUM DIODES

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MUNTZ PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M2		SR-0004	1215	1T1				
M3		SR-0004	1215	1T1				

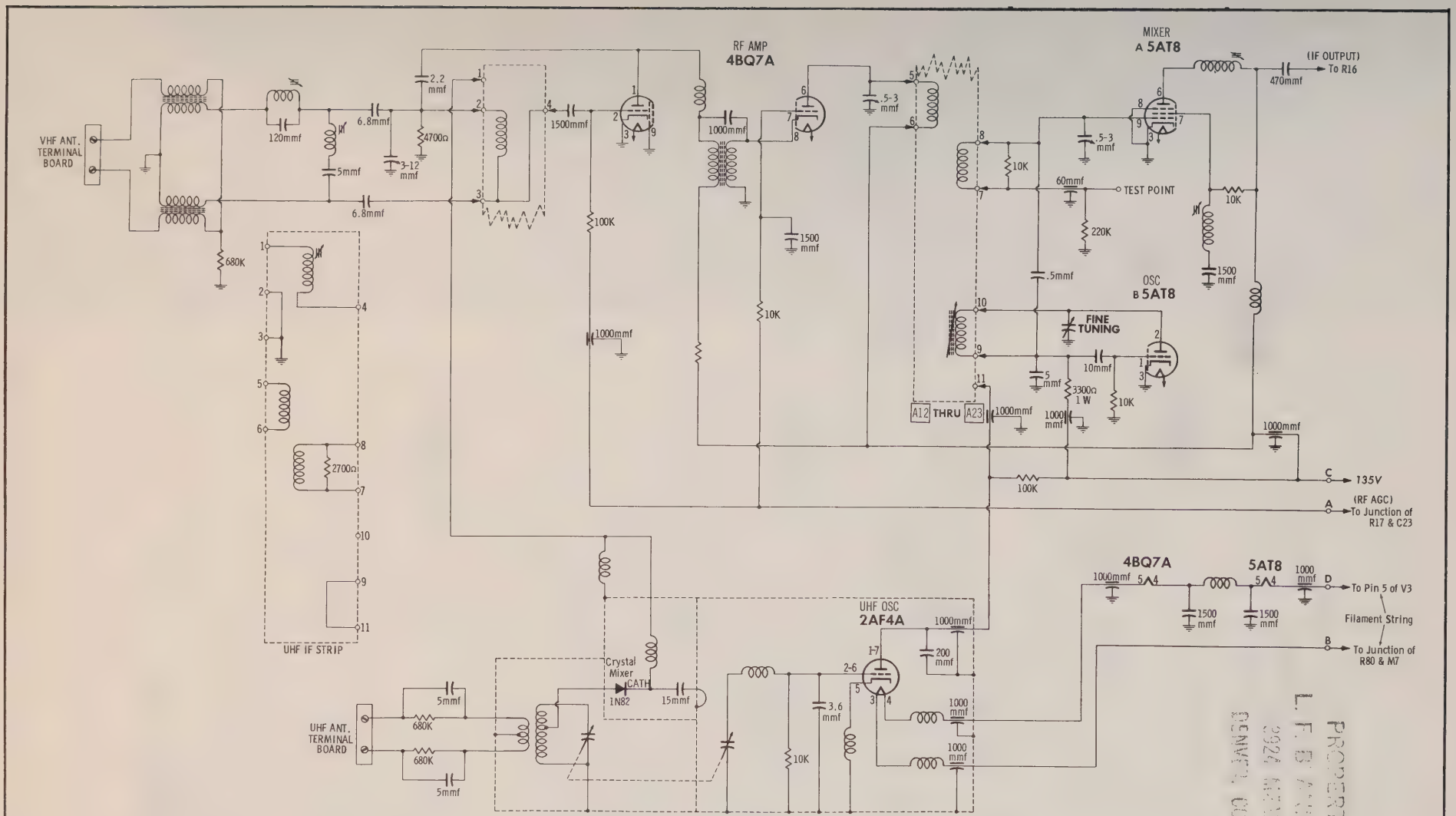
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		MUNTZ PART No.	SYLVANIA PART No.	
M4	TS-4C	CX-0031	1N60	Video Detector (Pigtail)
M5	1N60	CX-0031	1N60	Discriminator Detector (Pigtail)
M6	1N60	CX-0031	1N60	Discriminator Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M7	Dial Light	LS-0004-1	#1847
M8	Tuner	PR-0264*	VHF. Not used in some versions.
M9	Centering Device	PR-0234	Part of Deflection Yoke (T3) Rear Cover.
M10	Ion Trap	PR-0229	
	Cabinet	CW-0057	Walnut (Consolette)
	Cabinet	CW-0057-2	Mahogany (Consolette)
	Cabinet	CW-0057-4	Blond (Consolette)
	Cabinet	CW-0065	Mahogany (Table, Wood)
	Cabinet	CW-0065-2	Blond (Table, Wood)
	Cabinet	CW-0066	Pebble Tan (Table, Metal)
	Knob	KB-0055-3	VHF Fine Tuning (Translucent Tan)
	Knob	KB-0062-3	VHF Fine Tuning
	Knob	KB-0060-3	UHF Selector & Fine Tuning (Switch Type, Translucent Tan)
	Knob	KB-0068-3	VHF-UHF Fine Tuning (Turret Type, Translucent Tan)
	Knob	KB-0056-3	VHF Channel Selector (12 Position, Translucent Tan)
	Knob	KB-0061-3	Channel Selector (12 Position, Translucent Tan)
	Knob	KB-0067-3	VHF-UHF Channel Selector (13 Position, Turret Type, Translucent Tan)
	Knob	KB-0066-3	UHF Channel Selector (Turret Type, Translucent Tan)
	Knob	KB-0058-3	On-Off-Volume (Translucent Tan)
	Knob	KB-0063-3	Picture (Translucent Tan)
	Knob	KB-0064-3	Service Controls (Translucent Tan)
	Dial	DP-0009	UHF
	Mask	ES-0055	621 Table Models (Metal)
	Mask	ES-0064-2	Gold - 621 Table Models (Wood) & 621 Consolette Models.
	Mask	ES-0057-3	Grey (Optional) 621 Consolette Models.
	Safety Glass	WG-0019	621 Table Models (Metal)
	Safety Glass	WG-0019-2	Clear - 621 Table Models (Wood) & 621 Consolette Models.
	Safety Glass	WG-0020-2	Black Tinted - 621 Table Models (Wood) & 621 Consolette Models.

* The following are a list of alternate tuners that may be used in some versions:
PR-0251 (VHF)
PR-0252 (VHF)
PR-0252-1 (VHF)
PR-0253 (VHF-UHF)
PR-0254 (VHF)



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VHF Tuner Part No. PR-0253

ALTERNATE VHF-UHF TUNER SCHEMATIC

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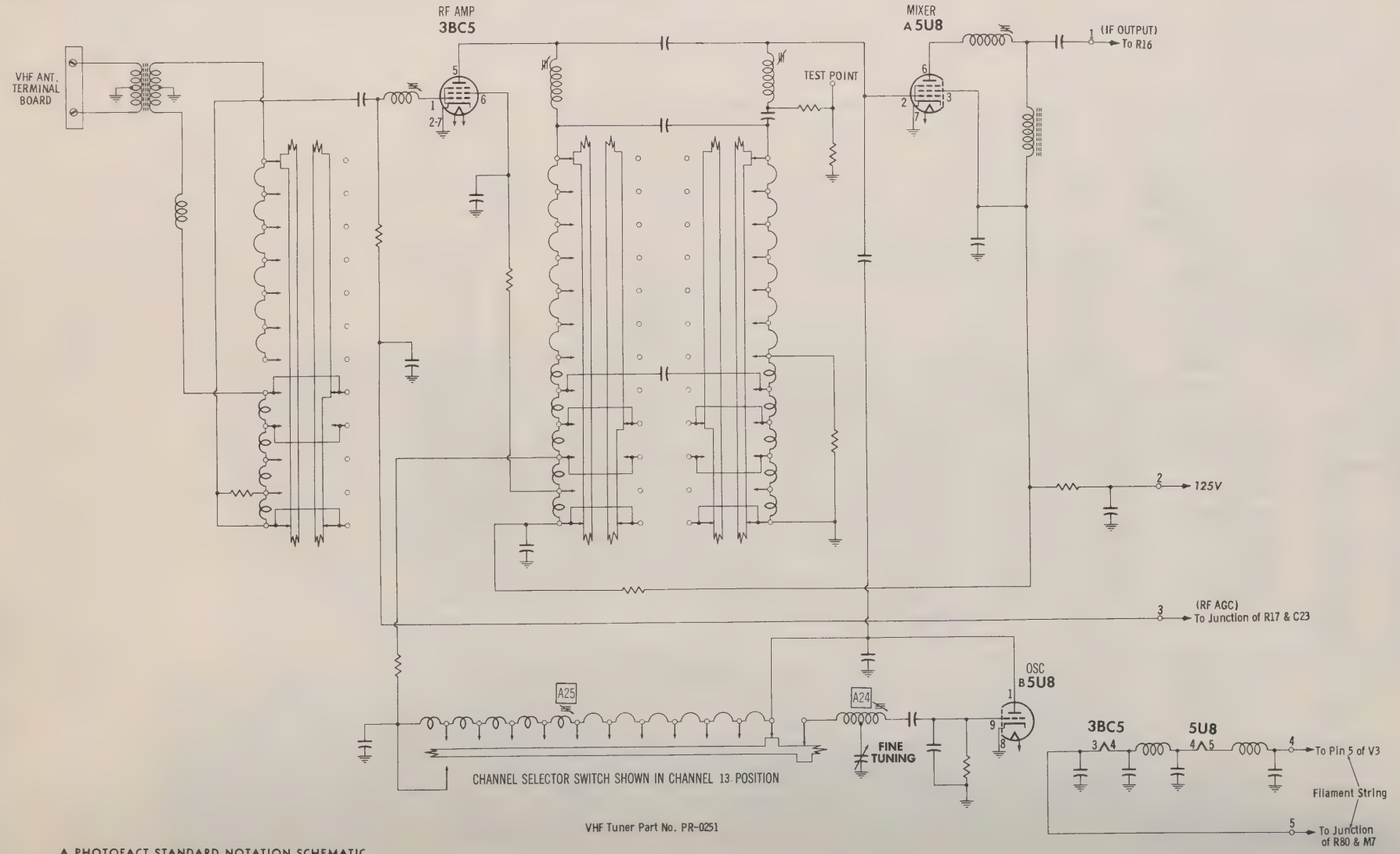
DENVER, COLOR



VHF Tuner Part No. PR-0251

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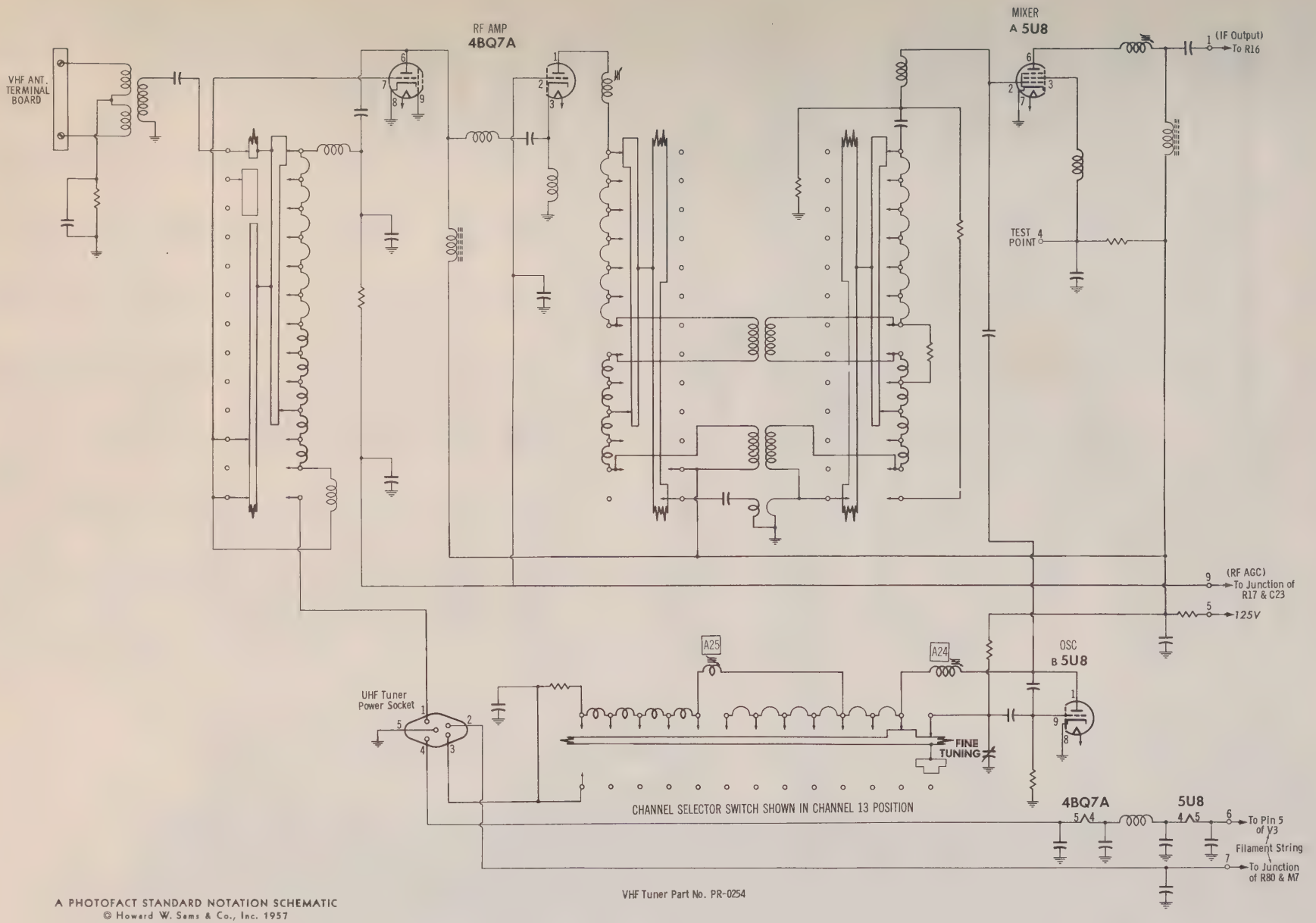
ALTERNATE VHF TUNER SCHEMATIC



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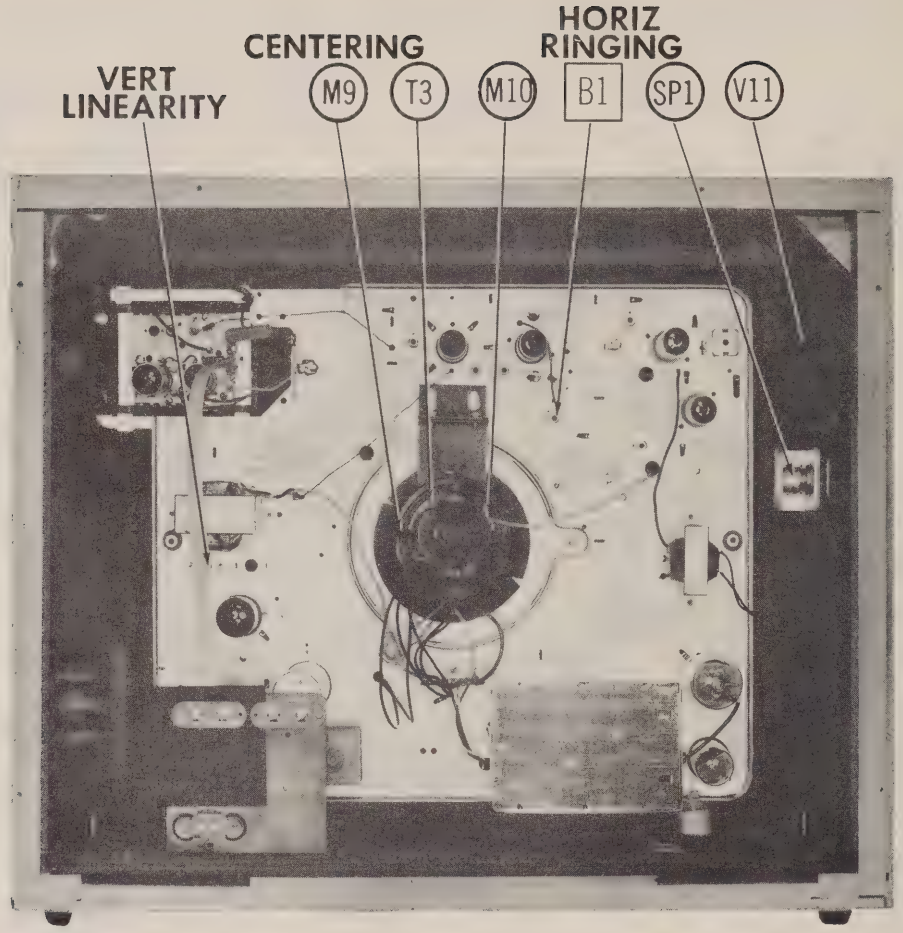
ALTERNATE VHF TUNER SCHEMATIC

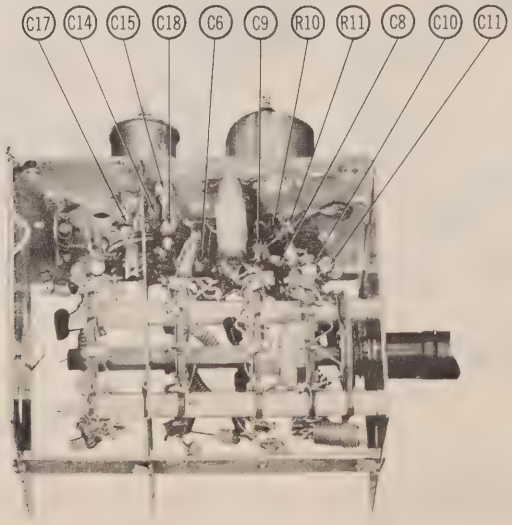


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Allow time for the receiver to warm up.

1. Adjust the set for a less than normal picture contrast.
2. Connect a clip lead across the ringing coil (L19).
3. Connect a clip lead from point Ⓕ to chassis.
4. Adjust the horizontal hold control for a single picture.
5. Remove clip lead from across the ringing coil and adjust the ringing coil slug (B1) with the core entering the coil from the chassis side until a single picture is attained. Then back off 1/4 turn counter clockwise for final adjustment of this coil.
6. Remove the clip lead from point Ⓕ and the picture will snap into sync.
7. Set the horizontal hold control to its maximum clockwise position and turn slowly counter clockwise until the picture is in sync. This is the proper setting of the horizontal hold control and should maintain sync for any signal level.



RF TUNER RIGHT SIDE

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SYLVANIA MODELS 3201 Series, 3302 Series (Ch. 1-610-1, 1-611-1)

SYLVANIA MODELS 3201 Series, 3302 Series (Ch. 1-610-1, 1-611-1)

TRADE NAME	Sylvania Models 3201DG, 3201GR, 3201RE, 3201WH (Ch. 1-610-1), 3302TA (Ch. 1-611-1)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	105-125 Volts AC-DC (or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.12 Amp. @117 Volts AC (or) 160MA @3 Volts DC & 8MA @67.5 Volts DC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximim position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator to B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output . If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1500KC	Tune to 1500KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	540KC	Tune to 540KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

SYLVANIA MODEL 3201DG

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amplifier	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	161-3024	PRS150/25V 5030/100	C0570	FP309	TMT-63	T-300	
B	▲30	150							
C	150	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	200	162-02147	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C3	47		166-0047N	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	5000		166-5000D	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C5	5000		166-5000D	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C6	5000		166-5000D	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C7A	150									
B	2000									
C	150		†190-0010	†PA-521	†PC-165				†DP-1	
D	10000									
E	5000									
C8	.0047	600	169-0039	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C9	.22	200	160-06022	P288N-22		CUB2P22		PT4022	2TM-P22	
C10	5000		166-5000D	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C11	20000		168-0014	BPD-02	DD-203	K085	817-02	PT412	5HK-S2	

† Items C7A, C7B, C7C, C7D, C7E, R8A, R8B, R8C and R8D are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	152-0034	B-70-S	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-20	76-2	US-27	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

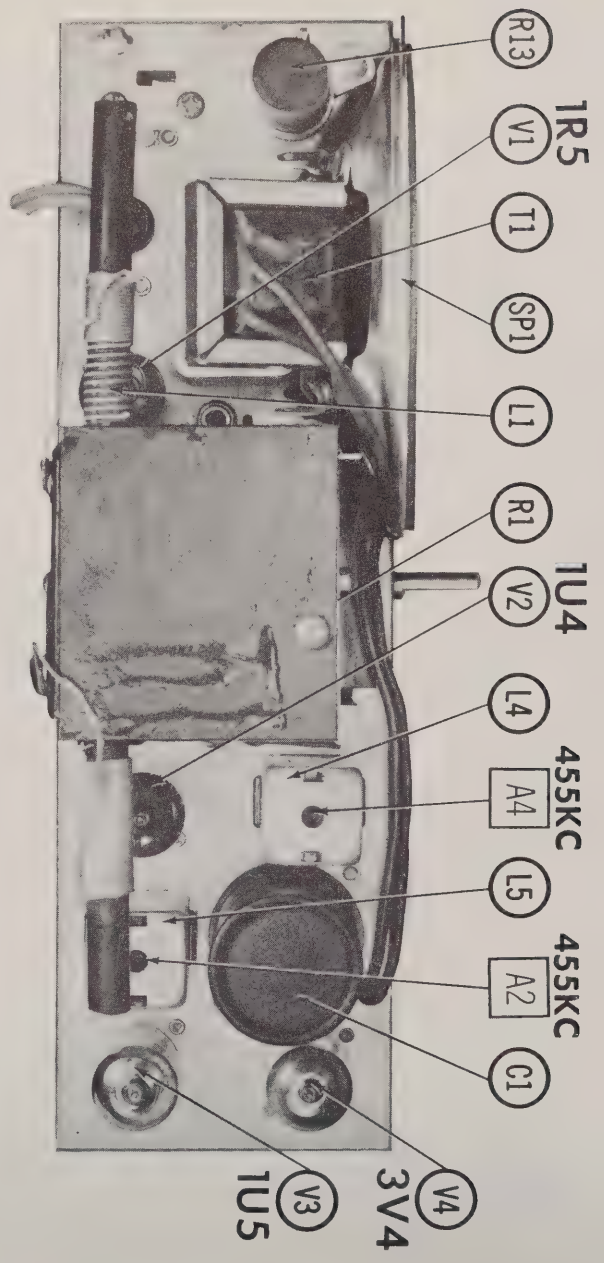
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R2	100K		181-0104	BTS-100K	
R3	4700Ω		181-0472	BTS-4700	
R4	3.3Meg		181-0335	BTS-3.3Meg	
R5	470K 5%		181-0474	BTS-470K 5%	
R6	3.3Meg		181-0335	BTS-3.3Meg	
R7	220Ω		181-0221	BTS-220	
R8A	10Meg		†190-0010	BTS-10Meg	
B	4.7Meg			BTS-4.7Meg	
C	1Meg			BTS-1Meg	
D	3.3Meg			BTS-3.3Meg	
R9	27Ω		181-0270	BTS-27	
R10	220K		181-0224	BTS-220K	
R11	270Ω		181-0271	BTS-270	
R12	1200Ω		181-0122	BTS-1200	
R13A	130Ω	3	†189-0062		
B	2200Ω	7			
R14	33Ω	1	187-0041	BW1-33	

† Items R8A, R8B, R8C, R8D, C7A, C7B, C7C, C7D, C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	9700Ω	3.5Ω	Part of Spkr.		A-2927①	S-3329	24S49	S-11X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.5Ω	539-0412	4A07	22381	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.6Ω		581-0008				Note 1
L2	Ant. Loading Coil			113-0036				Used in Ch. 1-611-1 only
L3	Osc. Coil	.7Ω	6.7Ω	113-0035			70-OSC.	
L4	Input IF	20Ω	20Ω	121-0102	16-6758	BC-352	12-C1	
L5	Output IF	20Ω	20Ω	121-0102	16-6758	BC-353	12-C2	

Note 1. Part #581-0009 used in Model 3302.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SYLVANIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.068A	517-0005	1003A	RS075	6S75	5M4	75	

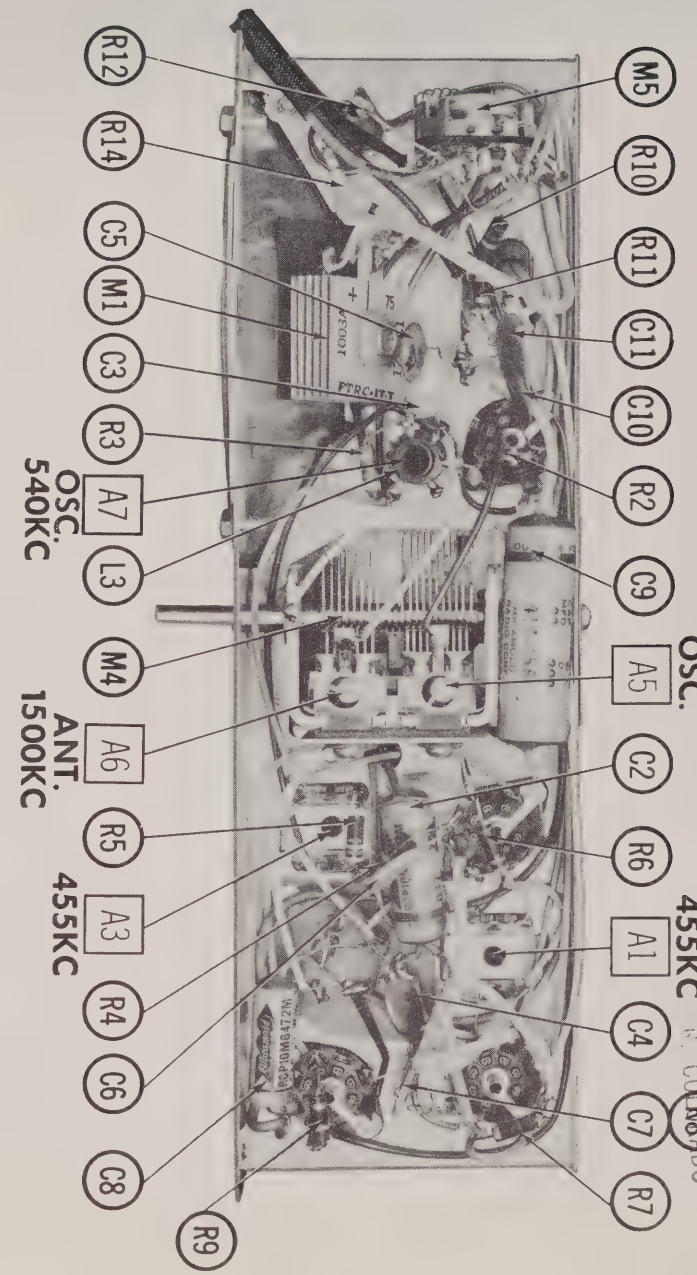
BATTERIES

ITEM No.	VOLTAGE	SYLVANIA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2 M3	1.5V "A" 67.5V "B"		964	477		21R	P45		Connect 2 in series

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M4	Tuning Cap.	170-0022	2 Gang (23-295MMF, 12-105MMF)
M5	Switch	573-0014	Power Changeover (5 Pole - 2 position, rotary, wafer type)
	Cabinet	813-0090	Model 3201GR
	Cabinet	813-0091	Model 3201DG
	Cabinet	813-0092	Model 3201RE
	Cabinet	813-0093	Model 3201WH
	Cabinet	814-0004	Model 3302TA
	Handle	818-0064	Model 3201GR
	Handle	818-0065	Model 3201DG
	Handle	818-0066	Model 3201RE
	Handle	818-0067	Model 3201WH
	Handle	818-0068	Model 3302TA
	Knob	741-0026	Tuning - Models 3201GR, 3201RE, 3201WH
	Knob	741-0027	Tuning - Model 3201DG
	Knob	741-0028	Tuning - Model 3302TA
	Knob	744-0042	On-off-volume - Models 3201GR, 3201DG, 3201RE, 3201WH
	Knob	744-0043	On-off-volume - Model 3302TA

CHASSIS—BOTTOM VIEW



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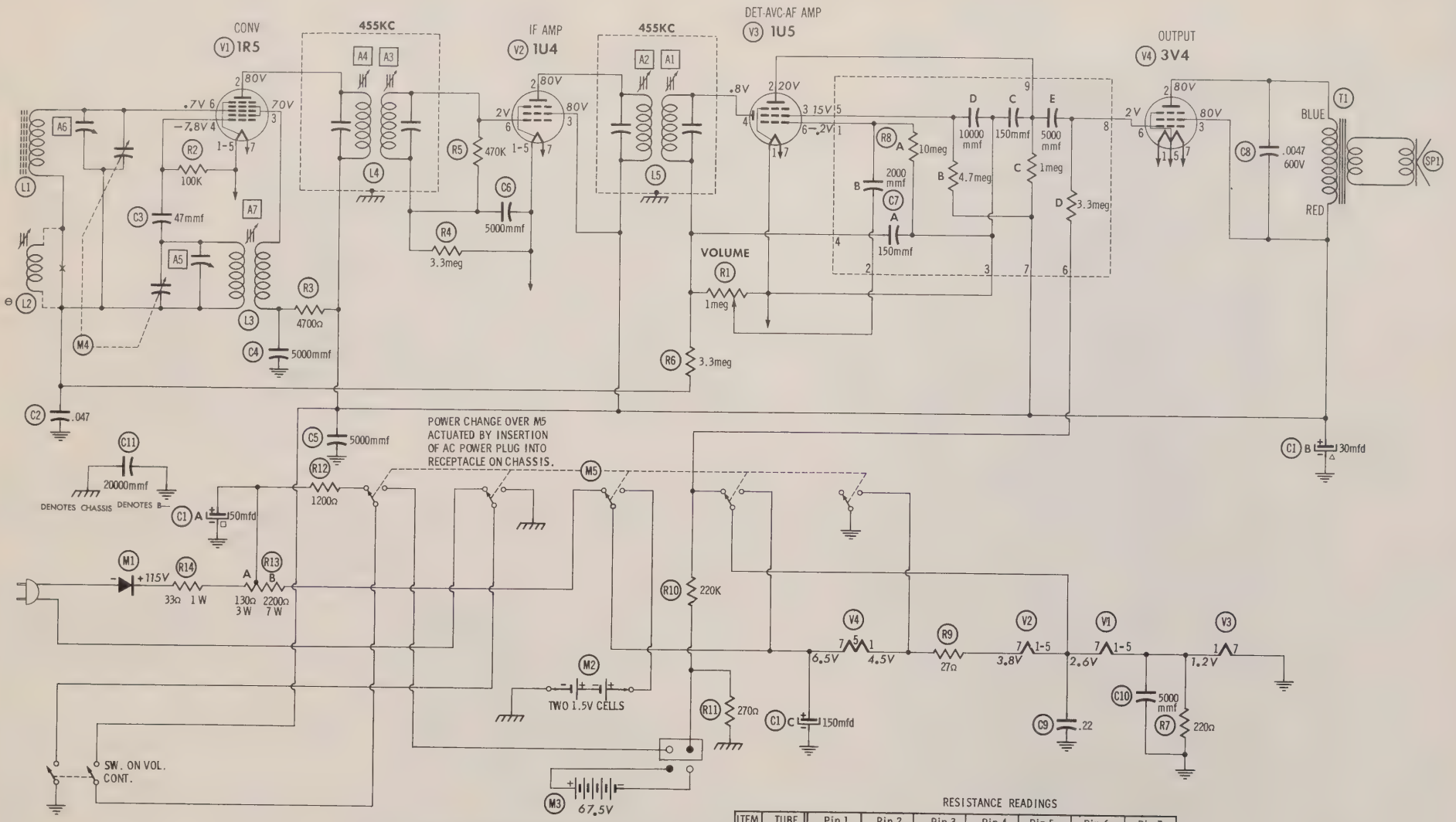
SYLVANIA MODEL 3201DG

SYLVANIA MODEL 3201DG



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†1400Ω	†6100Ω	100K	•	4.3Meg	•
V2	1U4	•	†1400Ω	†1400Ω	TP	•	3.3Meg	•
V3	1U5	•	†1Meg	†4.7Meg	1Meg	TP	10Meg	•
V4	3V4	•	†1900Ω	†1400Ω	TP	•	3.3Meg	•

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
TP TIE POINT.

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TELEFUNKEN
MODEL "Operette 6"

TELEFUNKEN
MODEL "Operette 6"

TRADE NAME	Telefunken Model "Operette 6"
SUPPLIER	American Elite, Inc., 7 Park Ave., New York, N.Y.
TYPE SET	AC Operated FM-AM-SW Receiver
TUBES (Six)	Types ECC85 FM RF Amp.-Converter, ECH81 1st FM IF Amp.-AM Mixer-AM Osc., EF89 2nd FM IF Amp., AM IF Amp., EABC80 Ratio Det., AM Det-AVC-AF Amp., EL84 Output, EM80 Tuning Indicator
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .47 Amp. @ 117 Volts AC

TUNING RANGE

SPECIAL	145-345KC	SHORT WAVE	50.5-16.5Meters
BROADCAST	515-1620KC	FREQ.MOD.	88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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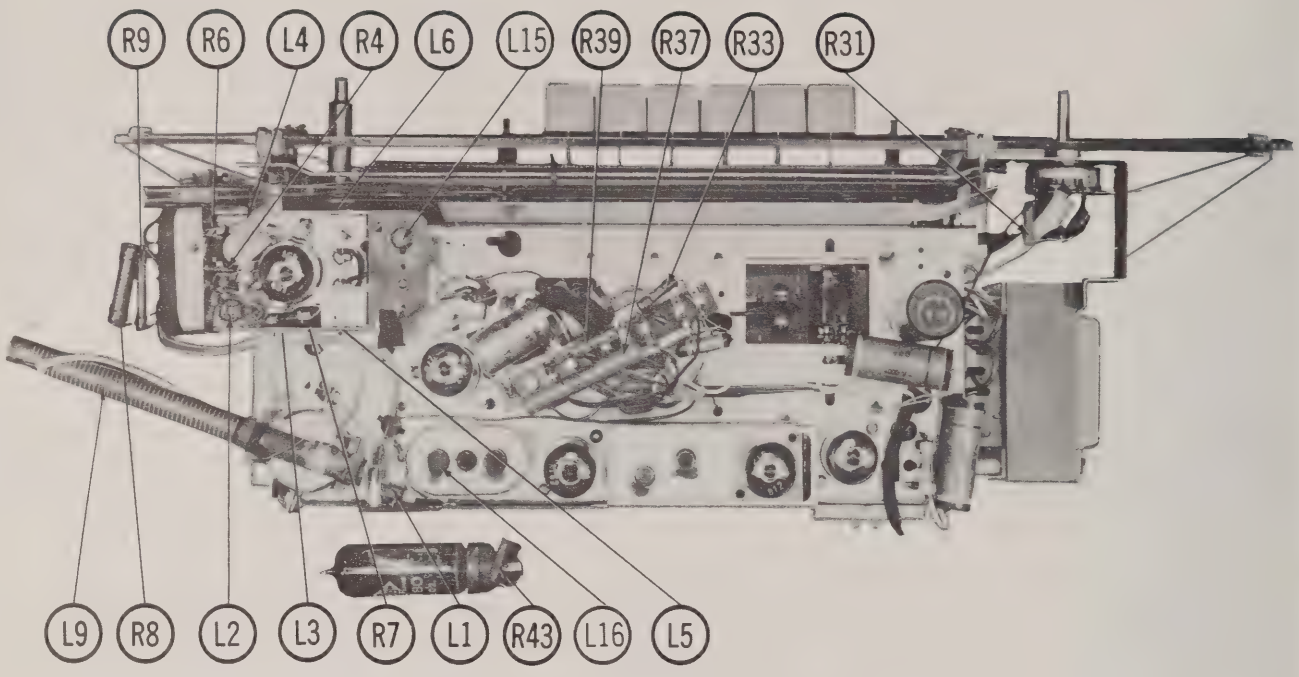
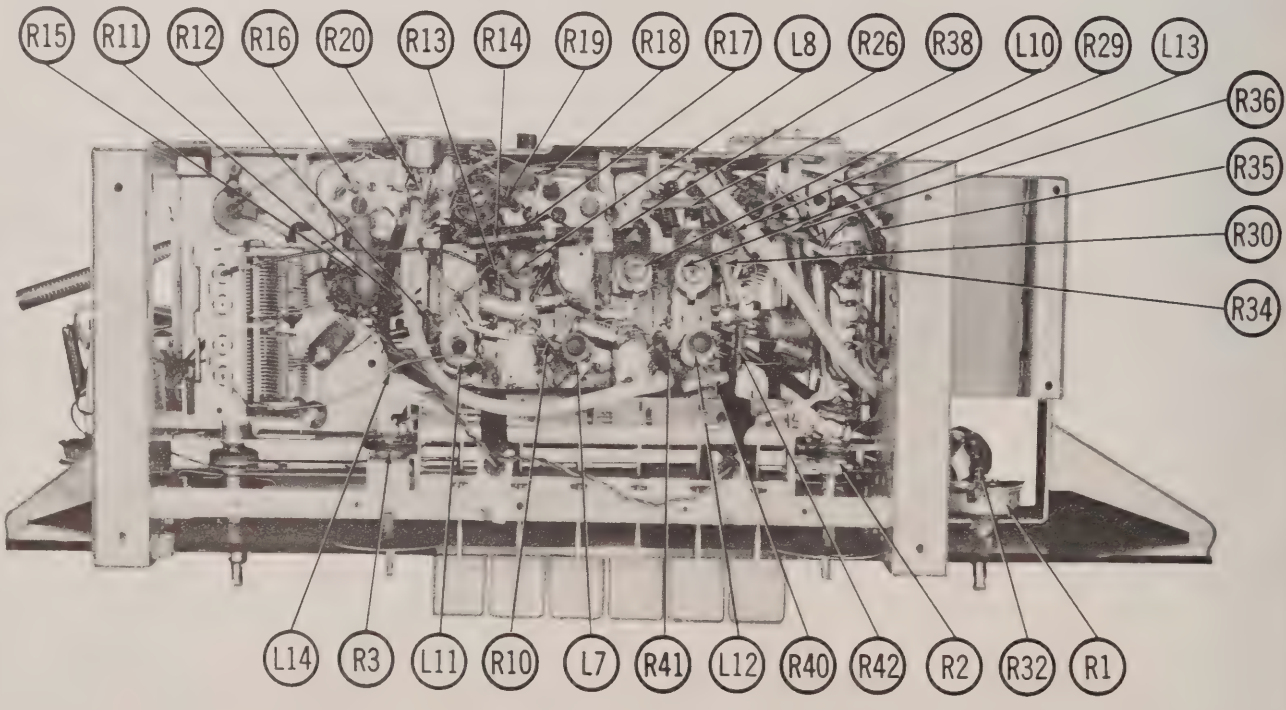
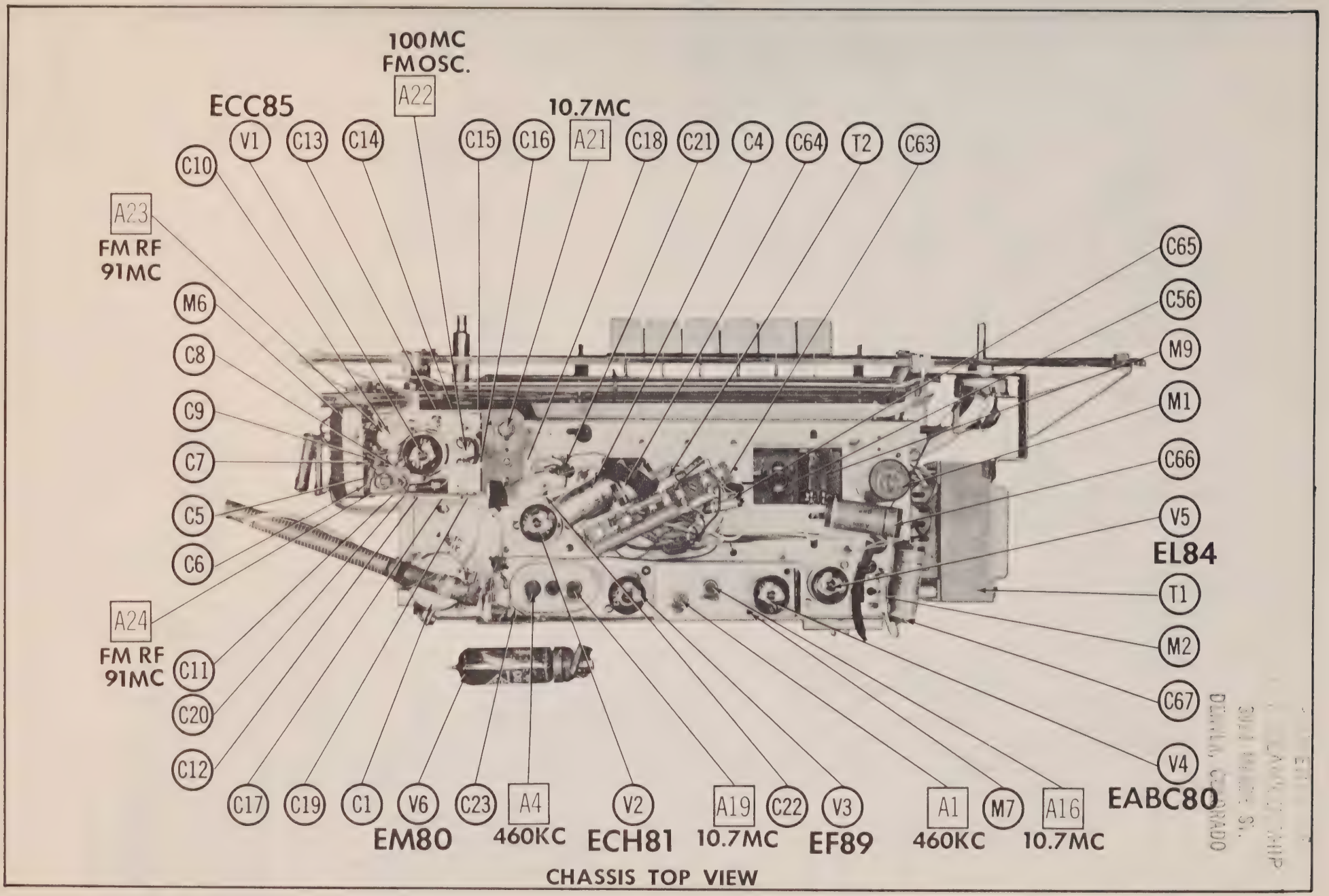


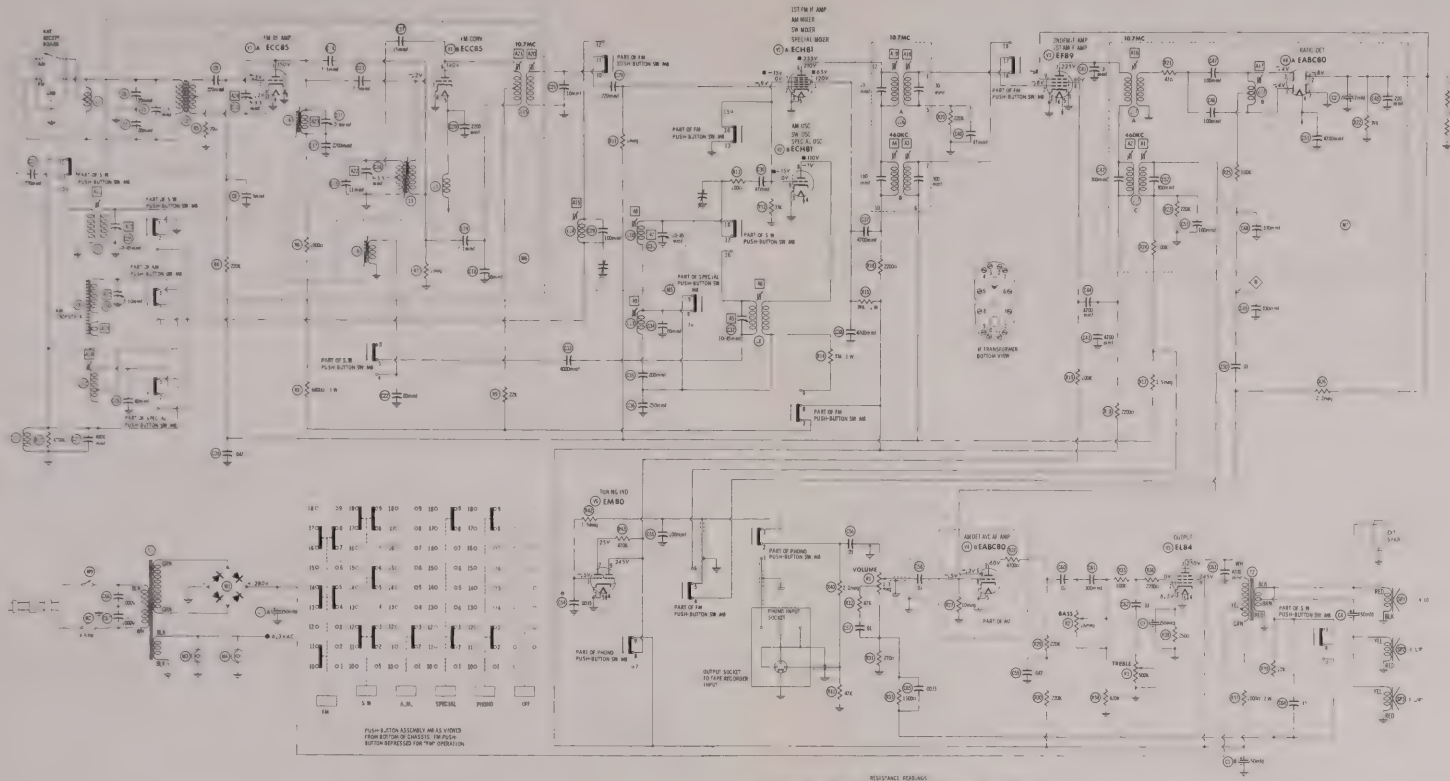
CHASSIS TOP VIEW - RESISTOR & INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENTIFICATION



CHASSIS TOP VIEW



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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM-SW SPECIAL BAND ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of EF89 (V3). Low side to chassis.	460KC (400∿ Mod)	AM	800KC	Across voice coil.	A1, A2	Adjust for maximum output.
2.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	"	A3, A4	"
3.	"	"	17.8MC	SW Logging pointer in "Start" position	17.8MC	"	A5	"
4.	"	"	7.2MC	"	7.2MC	"	A6	Adjust for maximum output. Repeat step 3.
5.	"	"	1450KC	AM	1450KC	"	A7	Adjust for maximum output.
6.	"	"	600KC	"	600KC	"	A8	Adjust for maximum output. Repeat step 5.
7.	"	"	200KC	Special	200KC	"	A9	Adjust for maximum output.
8.	100Ω & 200MMF in series.	High side thru dummy to antenna socket. Low side to chassis.	17.8MC	SW	17.8MC	"	A10	"
9.	"	"	7.2MC	"	7.2MC	"	A11	Adjust for maximum output. Repeat step 8.
10.	"	"	1450KC	AM	1450KC	"	A12	Adjust for maximum output.
11.	"	"	600KC	"	600KC	"	A13	With chassis installed in cabinet, adjust A13 for maximum output. Repeat step 10. (Remove chassis from cabinet.)
12.	"	"	200KC	Special	200KC	"	A14	Adjust for maximum output.
13.	"	"	460KC	AM	800KC	"	A15	Adjust for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
14.	500MMF	High side to pin 2 (grid) of EF89 (V3). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A16	Adjust for maximum deflection.
15.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
16.	"	"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A18, A19	Adjust for maximum deflection.
17.	Direct	High side to ungrounded tube shield floating on ECC85 (V1). Low side to chassis.	"	"	100MC	"	A20, A21	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
14.	500MMF	High side to pin 2 (grid) of EF89 (V3). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
15.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A17	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of crossover lines.
16.	"	"	"	"	"	Vert. amp. to point Ⓐ. Low side to chassis.	A18, A19	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
17.	Direct	High side to ungrounded tube shield floating on ECC85 (V1). Low side to chassis.	"	"	100MC	"	A20, A21	"

FM RF ALIGNMENT

A24 (neutralization adjustment) has been preset by manufacturer and should not be tampered with.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
18.	Direct	Across FM antenna terminals.	100MC	FM	100MC	DC probe to point Ⓐ. Common to chassis.	A22	Adjust for maximum deflection.
19.	"	"	91MC	"	91MC	"	A23	"

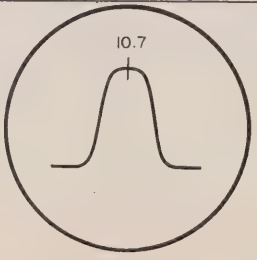


FIG. 1

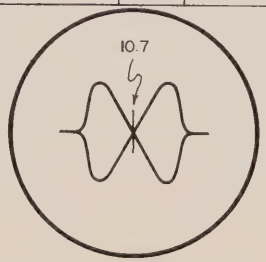
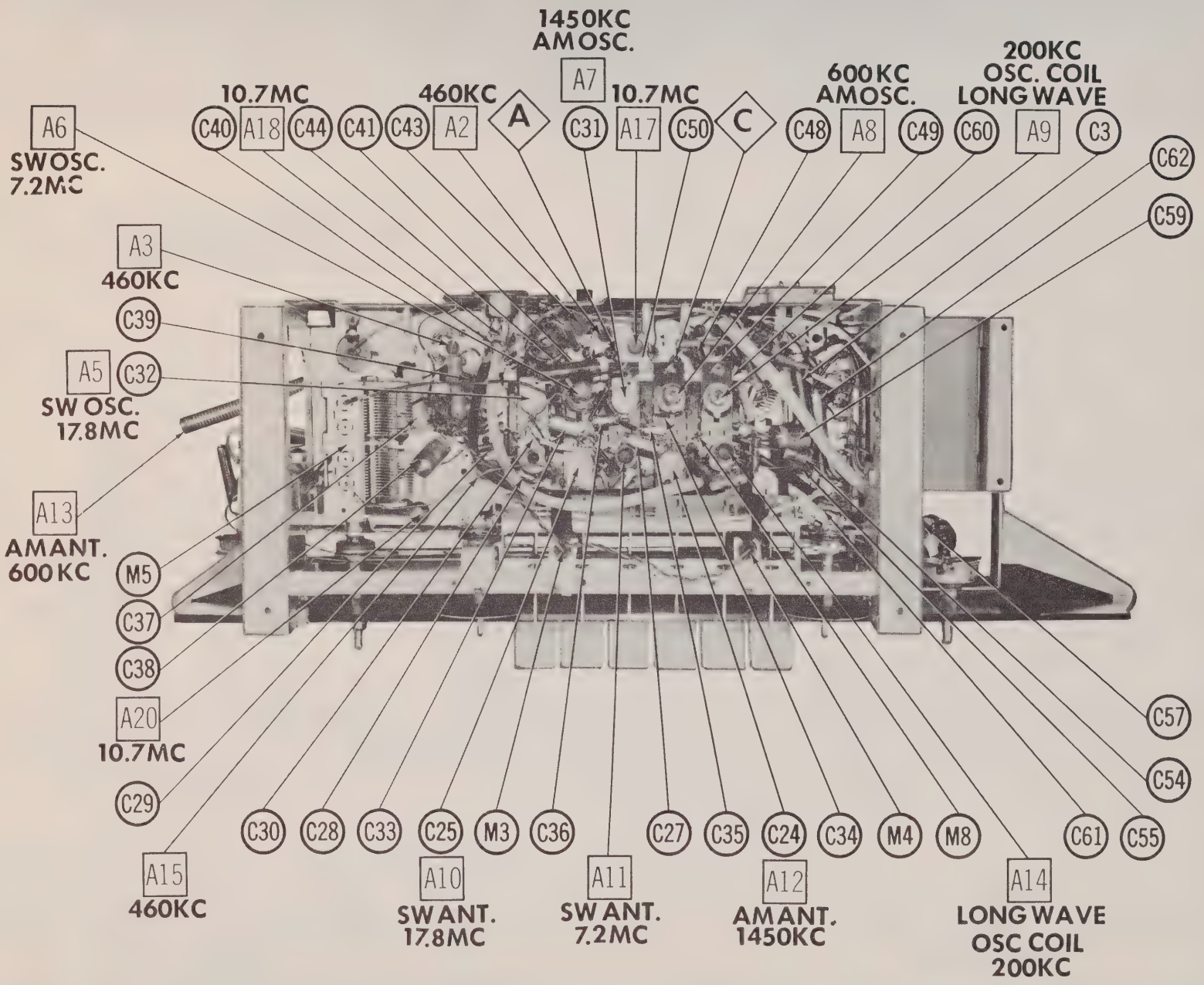


FIG. 2



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -FM Conv.	ECC85	
V2	1st FM IF Amplifier- AM Mixer-AM Osc.	ECH81	
V3	2nd FM IF Amplifier- AM IF Amplifier	EF89	
V4	Ratio Det. -AM Det. - AVC-AF Amp.	EABC80	
V5	Output	EL84	
V6	Tuning Indicator	EM80	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Telefunken PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	350	8265351	PRS450V4040		FP137			
B	50	350				TC79			
C2	2	30			BBR2-50	TAP100-2	ML2-50		R2308*
C3	50	15	8234076	SRE25V50	BBR50-25				18D26
C4	50	4	8234080	SRE6V50	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Telefunken PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	7.5									
C6	20									
C7	20									
C8	3									
C9	220									
C10	.5-3.5									
C11	2-6									
C12	2200									
C13	7.5									
C14	7.5									
C15	11									
C16	.5-3.5									
C17	15									
C18	50									
C19	7.1									
C20	2200									
C21	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C22	20			NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C23	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C24	2-10									
C25	10-45									
C26	40									
C27	4000									
C28	100			NP0-SI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	

PARTS LIST AND DESCRIPTIONS (Continued)
CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Telefunken PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C29	220			NP0-SI220	TCZ-220	TZ38	NP0-335-221		5TCC-T22	
C30	47			NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C31	10-45									
C32	10-45									
C33	4000									
C34	70									
C35	200				TCZ-200	TZ37	NP0-334-201			
C36	250									
C37	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C38	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C39	.047	250		BPD-05	DF-503	CUB2S47		PT415	2TM-S47	
C40	47			NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C41	3			NP0-DI3		Z007	NP0A-030	ZT-553		
C42	300									
C43	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C44	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C45	220			BPD-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C46	100			NP0-SI100	D6-101	TZ30	801-101	MCB235	5TCC-T1	
C47	100			NP0-SI100	D6-101	TZ30	801-101	MCB235	5TCC-T1	
C48	330			1469-00033	D6-331	5R5T33	811-331		MS-33	
C49	330			1469-00033	D6-331	5R5T33	811-331		MS-33	
C50	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C51	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C52	300									
C53	100			BPD-0001	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C54	.0033	500		BPD-0033	D6-332	CUB6D33	GP2-333-332	PT-6233	6TM-D33	Note 1
C55	100			BPD-0001	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C56	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C57	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C58	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C59	.047	500		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C60	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C61	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	
C62	.01	200		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C63	4700	500		BPD-0047	DD-472	1W5D47	811-0047	UC-5247	1FM-247	
C64	.15	125		P288N-15		CUB2P15		PT4015	2TM-P15	
C65	.0033	500		BPD-0033	D6-332	CUB6D33	811-0033	PT6233	6TM-D33	
C66	.1	1000							10TM-P1	
C67	.1	1000							10TM-P1	

Note 1: Some versions may use .01MFD in this application.

ANKEN-HIP
MEADE ST.
, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Telefunken PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1.3Meg	½	8265691	AB-742	A47-1.5Meg-S		U155	Volume
B	Shaft		Not Req.	AK-9	RS-2		Not Req.	Attach to R1A
R2	16Meg	½	8245118					Bass
R3	500K	½	8245119					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Telefunken PART No.	IRC PART No.	
R4	220K			BTS-220K	
R5	20Ω			BW½-20 5%	
R6	1000Ω			BTS-1000	
R7	1Meg			BTS-1Meg	
R8	6800Ω	1		BTA-6800	
R9	22K			BTS-22K	
R10	4700Ω			BTS-4700	
R11	1Meg			BTS-1Meg	
R12	33K			BTS-33K	
R13	100Ω			BTS-100	
R14	33K	1		BTA-33K	
R15	39K	1		BTA-39K	
R16	2200Ω			BTS-2200	
R17	1.5Meg			BTS-1.5Meg	
R18	2200Ω			BTS-2200	
R19	100K			BTS-100K	
R20	220K			BTS-220K	
R21	47Ω			BTS-47	
R22	39K			BTS-39K	
R23	220K			BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Telefunken PART No.	IRC PART No.	
R24	100K			BTS-100K	
R25	100K			BTS-100K	
R26	2.2Meg			BTS-2.2Meg	
R27	10Meg			BTS-10Meg	
R28	4700Ω			BTS-4700	
R29	220K			BTS-220K	
R30	220K			BTS-220K	
R31	270Ω			BTS-270	
R32	47K			BTS-47K	
R33	1500Ω			BTS-1500	
R34	820K			BTS-820K	
R35	100K			BTS-100K	
R36	2200Ω			BTS-2200	
R37	1000Ω	2		BTB-1000	
R38	250Ω			BTS-240 5%	
R39	12K			BTS-12K	
R40	2.2Meg			BTS-2.2Meg	
R41	47K			BTS-47K	
R42	1.5Meg			BTS-1.5Meg	
R43	470K			BTS-470K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Telefunken PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .47A	228VAC ⓐ .055A	6.3VAC ⓐ 3.3A		9037090					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Telefunken PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω	1.8Ω	9037081						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Telefunken PART No.	QUAM PART No.	RCA TYPE No.	
SP1	7" X 10"	PM	4.9Ω	9044416			
SP2	3 1/4"	PM	5.5Ω	8213077	3A15TZ5.5		
SP3	3 1/4"	PM	5.5Ω	8213077	3A15TZ5.5		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Telefunken PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		9037049				Tapped
L2	FM Ant. Coil	0Ω	0ΩCT					
L3	Fil. Choke	0Ω						
L4	FM RF Coil	0Ω						
L5	FM Osc. Coil	0Ω	0Ω					
L6	IF Trap	0Ω						
L7	SW RF Coil	0Ω	.4Ω	9036219				
L8	SW Osc. Coil	0Ω	.5Ω	7035805				
L9	Loop Stick	1.4Ω		9037084				
L10	BC Osc. Coil	1.8Ω		9037082				
L11	IF Trap	38Ω		9037049				
L12	Long Wave RF Coil	6Ω		7035802				
L13	Long Wave Osc. Coil	8.5Ω		9037083				
L14	IF Trap	10.5Ω		9037077				
L15	1st FM IF	1ΩCT	1.1Ω					
L16 A	2nd FM IF	1.4Ω	.9Ω	9044346				
B	1st AM IF	.6Ω	4.2Ω					
L17 A	Ratio Det. Trans.	2.3Ω	.2Ω					
B	Ratio Det. Coil	.2ΩCT						
C	2nd AM IF	4.4Ω	4.2Ω					

SELENIUM RECTIFIER

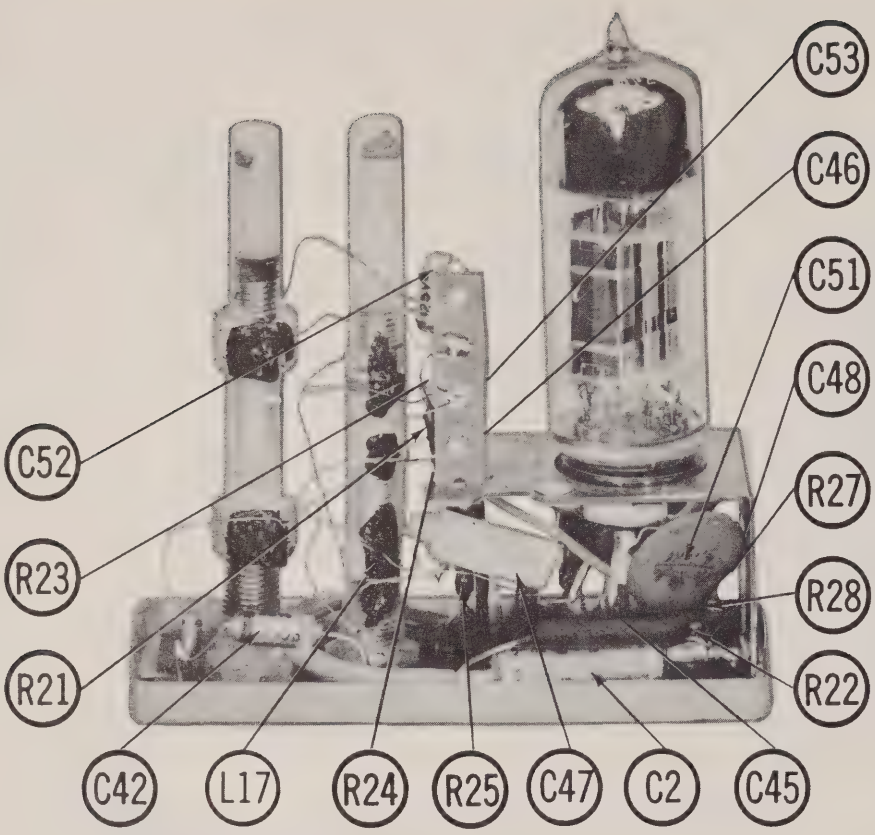
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Telefunken PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.055A	6043621		60-9150 ①				① 2 required.

FUSES

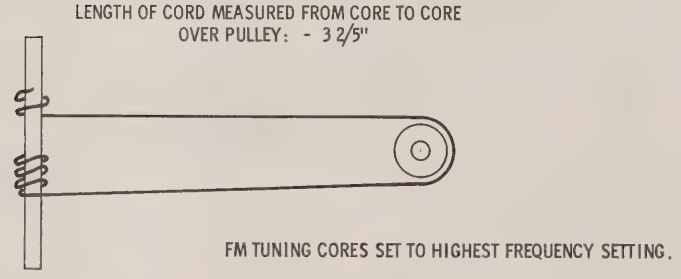
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Telefunken PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		.6A	8248265	7041261				

MISCELLANEOUS

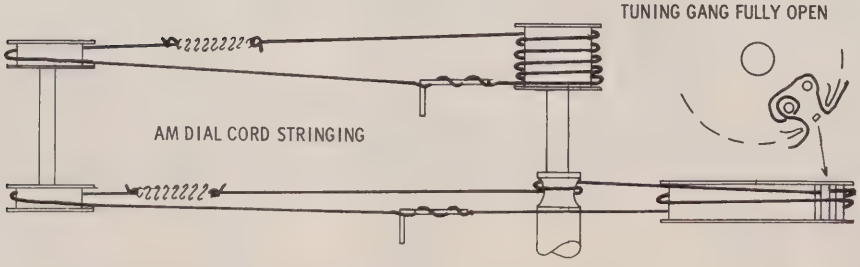
ITEM No.	PART NAME	Telefunken PART No.	NOTES
M3	Dial Light	8247002	7V, .3A Screw Type
M4	Dial Light	8247002	7V, .3A Screw Type
M5	Tuning Cap.	8236017	AM (2 Gang: 11-510MMF, 11-445MMF)
M6	FM Tuner Converter Ass'y.	9049452	Less V1. Includes Coils, Capacitors & Resistors.
M7	FM-AM Detector Ass'y.	9049358	Less V4. Includes Coils, Capacitors & Resistors.
M8	Switch	9045240	Selector, Pushbutton Ass'y. (Slide Type) Includes L7, L8, L10, L11, L12, L13, C24, C25, C31 & C32.
M9	Switch		Power (On-Off). Part of M8.
	Cabinet	8700028	
	Knob	8213057	FM & SW Log
	Knob	8213706	Volume
	Knob	8213056	AM Tuning
	Pushbutton	6824854	6 Used (Plastic)
	Dial Pointer	9045238	AM & SW Ranges.
	Dial Pointer	9045237	FM Range.



CHASSIS SUB ASSEMBLY



DRIVE-CORD WITH CORE IN THE F.M. - R.F. AND MIXER-STAGE



DIAL CORD STRINGING

ULTRATONE MODELS 155, 255

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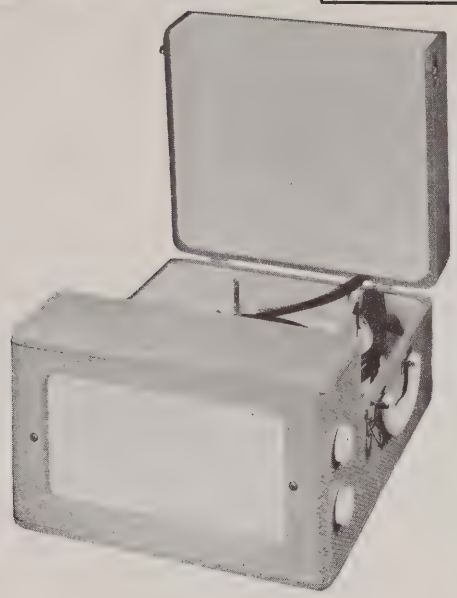
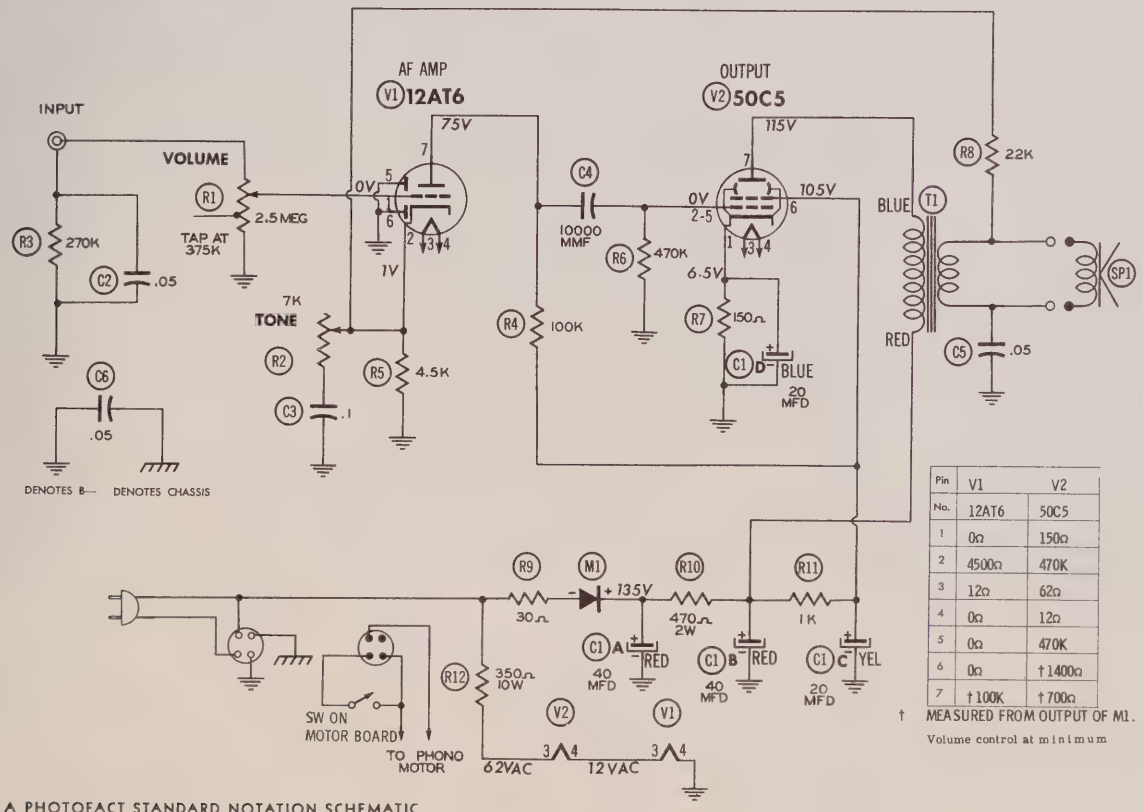
ULTRATONE
MODELS 155, 255



TRADE NAME	Ultratone Models 155, 255
MANUFACTURER	Audio Industries, Michigan City, Indiana
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Two)	Types 12AT6 AF Amplifier, 50C5 Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .24 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 950-PHOTOFACT SET 216 - FOLDER 11 OR RECORD CHANGER MANUAL CM-5.



Pin No.	V1 12AT6	V2 50C5
1	0Ω	150Ω
2	4500Ω	470K
3	12Ω	62Ω
4	0Ω	12Ω
5	0Ω	470K
6	0Ω	†1400Ω
7	†100K	†700Ω

† MEASURED FROM OUTPUT OF M1.
Volume control at minimum

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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342-13

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	

ITEM No.	USE	TYPE	NOTES
V2	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Ultratone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150			BBRQ44315C		CDBQ-1001		R2199*
B	40	150							
C	20	150							
D	20	25							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Ultratone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C4	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C6	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Ultratone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2.5Meg	1/2	401E	ABT-79				Volume, Tap@ 375K
B	Shaft		Not Req.	AK-4				Attach to R1A
R2A	7000Ω	1/2	408G	AB-15	A47-10K-Z	Q13-116	U-18	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Ultratone PART No.	IRC PART No.	
R3	270K			BTS-270K	
R4	100K			BTS-100K	
R5	4500Ω			BTS-4700	
R6	470K			BTS-470K	
R7	150Ω			BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Ultratone PART No.	IRC PART No.	
R8	22K			BTS-22K	
R9	30Ω			BTS-33	
R10	470Ω	2		BTB-470	
R11	1000Ω			BTS-1000	
R12	350Ω	10		1 3/4A-350	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Ultratone PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	4Ω	1209B	ZU101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mtg. hole.

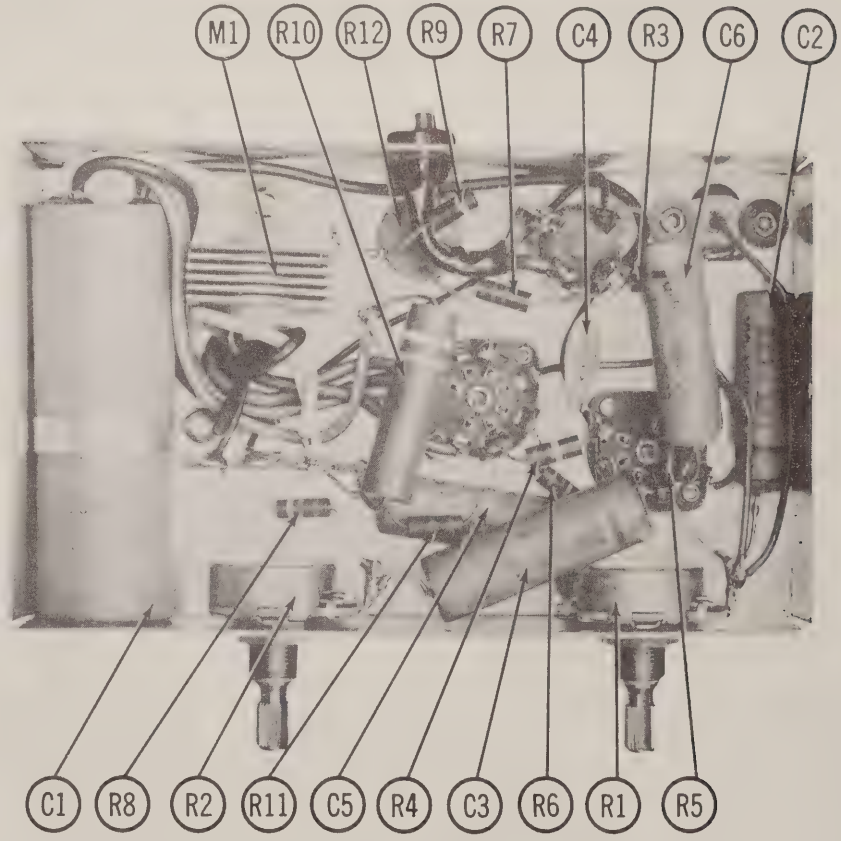
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Ultratone PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"	PM	4Ω	2626	5A1	228S1	① Used in model 225.
	8"	PM	3.6Ω	2629 ①	8A21	208S2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Ultratone PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.050A		1263A	RS065	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Ultratone PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	(Model 155)	53-2	G-AG	43	0-2 or S-2	
M2	(Model 255)	112-TS	A-1 A-3			

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Ultratone PART No.	JENSEN PART No.	WALCO PART No.	
M3	(Model 155)	*S-652 or †S-642 or ♦S-642D	* W-3AGA or †W-3AGS or ♦W-3MGD	* Metal † Jewel ♦ Diamond
M3	(Model 255)		†W-64S or ♦W-64D and †W-64MGS or ♦W-64MGD	

PHOTOFACT* Folder
*TRADE MARK

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)

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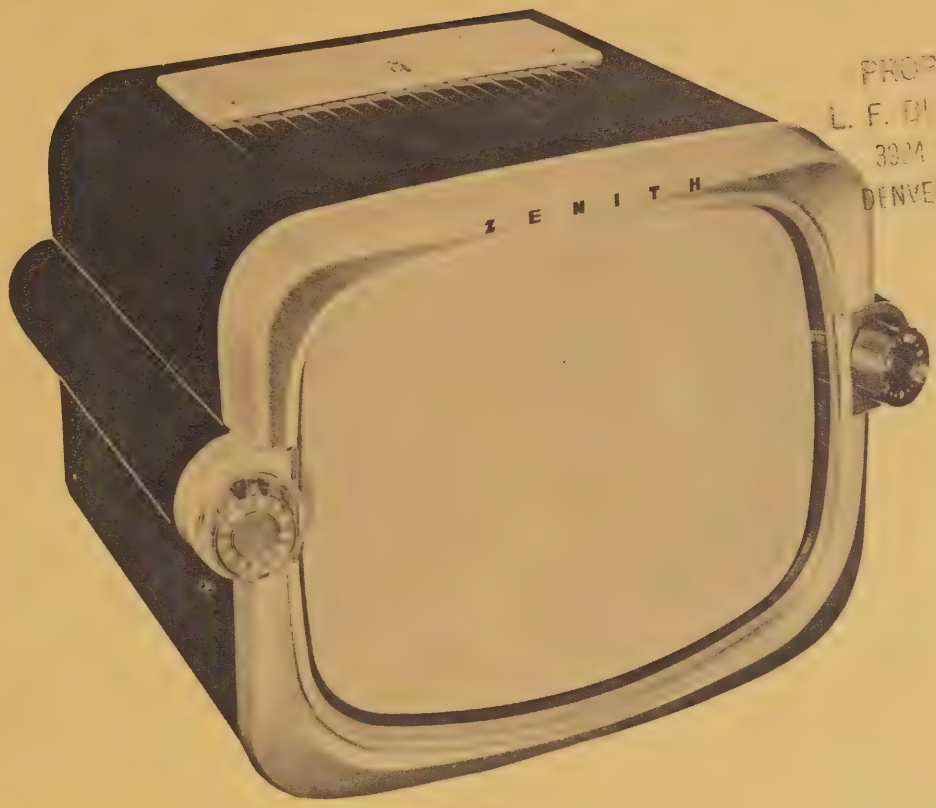

ZENITH MODEL Z1814Y

TRADE NAME	Zenith	MODELS	CHASSIS
		Z1814R, RU, Y, YU	16Z20, U
		Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU	16Z21, U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC 60 Cycles	RATING 1.4 Amp. @117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)

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PHOTOFACT* Folder
*TRADE MARK
RETMA MEMBER

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 small push-on type control knobs from top panel of cabinet.

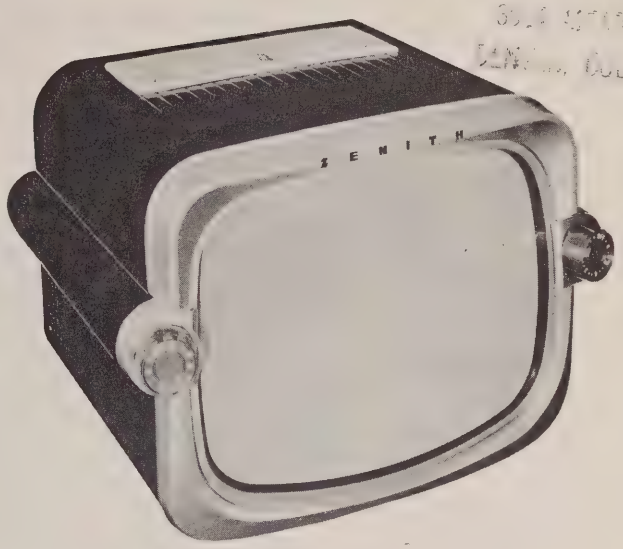
2. Remove 8 metal screws. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 4 metal screws. (2 screws from top rear mounting bracket and 2 screws from bottom rear mounting bracket).

5. Remove entire unit (chassis, picture tube, mask and safety glass) from front of cabinet.

6. Remove 2 speaker nuts. Remove speaker.



MODEL	CHASSIS
Z1814Y	16Z20

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove volume and channel selector knobs. Remove 6 metal screws now exposed by knob removal. Remove safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to its mid-range position and adjust the horizontal frequency coil (L12) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R8) for maximum volume and MINIMUM buzz located on rear of set.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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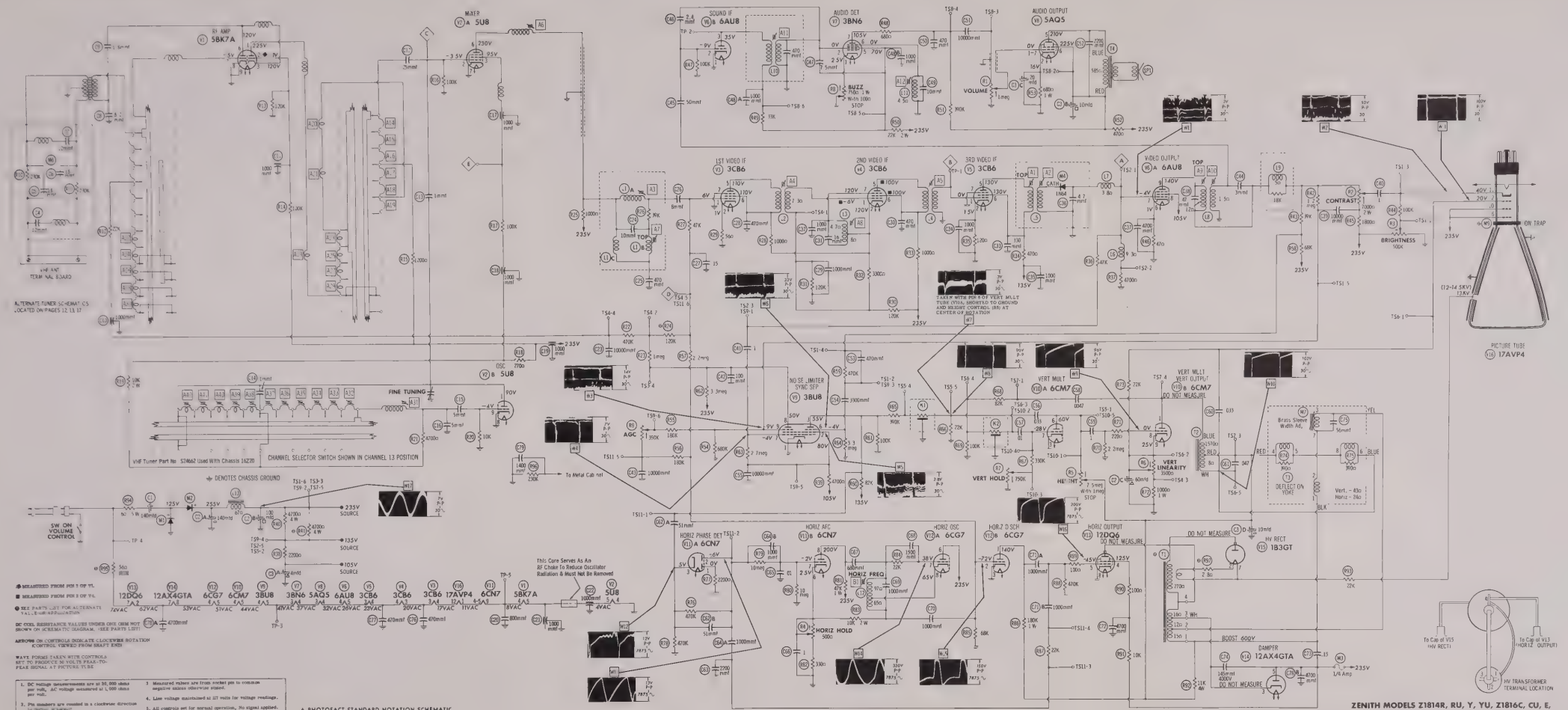
RF AMP V1 5BK7A
MIXER V7A 5U8
OSC V7B 5U8
SOUND IF V6B 6AU8
AUDIO DET V7 3BN6
AUDIO OUTPUT V8 5AQ5
1ST VIDEO IF V2 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 3CB6
VIDEO OUTPUT V6A 6AU8
NO SE. LIMITER SYNC SEP V9 3BU8
VERT MULT V10A 6CM7
VERT MULT VERT OUTPUT V10B 6CM7
HORIZ PHASE DET V11A 6CN7
HORIZ AFC V11B 6CN7
HORIZ OSC V12A 6CG7
HORIZ D SCH V12B 6CG7
HORIZ OUTPUT V13 12DQ6
HV RECT V15 1B3GT
DAMPER V14 12AX4GTA
PICTURE TUBE V16 17AVP4
VOLUME
BUZZ
FINE TUNING
AGC
CONTRAST
BRIGHTNESS
VERT LINEARITY
VERT HOLD
HEIGHT
HORIZ FREQ
HORIZ HOLD
BOOST 600V
ON TRAP
SW ON VOLUME CONTROL
VHF ANT TERMINAL BOARD
VHF Tuner Part No 53A6A2 Used With Chassis 16Z20
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 12 13 17
DENOTES CHASSIS GROUND
To Metal Cabinet
This Core Serves As An RF Choke To Reduce Oscillator Radiation & Must Not Be Removed
TAKEN WITH PIX 8 OF VERT MULT TUBE (V10A), GROUNDED TO GROUND AND HEIGHT CONTROL (R81) AT CENTER OF ROTATION
DO NOT MEASURE
To Cap of V15 (HV RECT)
To Cap of V13 (HORIZ OUTPUT)
HV TRANSFORMER TERMINAL LOCATION
12DQ6 12AX4GTA 6CG7 6CM7 3BU8 3BN6 5AQ5 6AU8 3CB6 3CB6 3CB6 17AVP4 6CN7 5BK7A
12VAC 6.2VAC 53VAC 51VAC 44VAC 40VAC 37VAC 32VAC 20VAC 20VAC 20VAC 12VAC 11VAC 6VAC
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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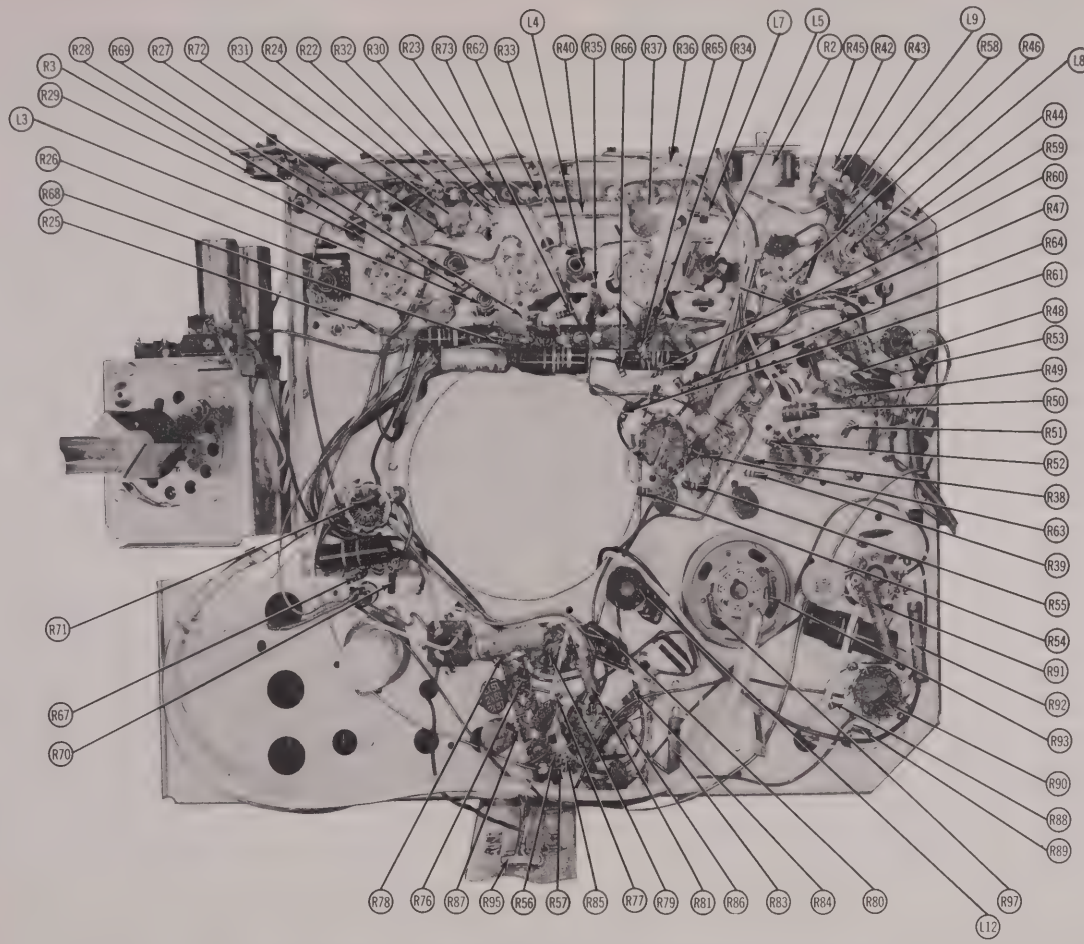
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction looking at socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.

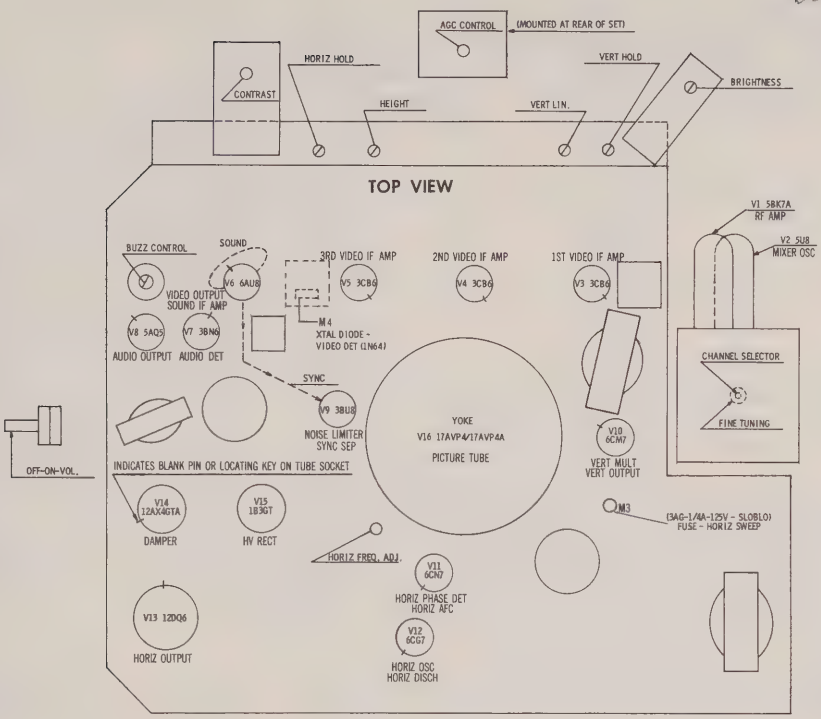
ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

PROF.
L. F. BLANKENSHIP
3924 MOLOE S.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

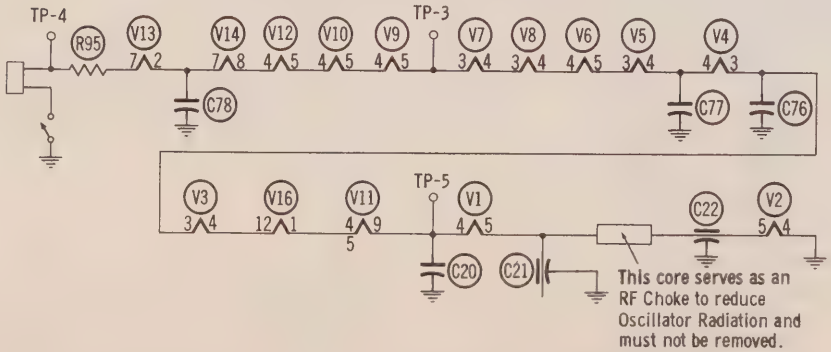
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V9, V10**
No horiz. sync - **V9, V11, V12**
No vert. or horiz. sync - **V9**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16, Fuse (M3)**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, M1, M2**
Vert. off freq. - **V9, V10**
Horiz. off freq. - **V9, V11, V12**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative (See circuit below).



SET 342 FOLDER 14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube (V13) to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the mixer-oscillator tube (V2) from its socket and connect a wire to the grid (pin 2 on 5U8 or pin 9 on 5CG8). Place the tube back in the socket.
If unused, a clip lead from the loose end of the wire to chassis
Connect the negative lead of a 6 volt battery or low impedance bias supply to point (D). Connect the positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to point (B) Low side to chassis.	43MC (0MC Swp)	41.25MC 45.75MC	Any	Vert. Amp thru 10K to point (X) Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1 with markers as near bumps as possible. If proper response curve cannot be obtained, check to see that the two cores are entering their respective windings from opposite ends of the coils.
2.	"	High side to point (B) Low side to chassis	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	"	A3, A4, A5, A6	Adjust for response curve similar to Fig. 2, with markers located as shown. A3 and A6 affect the peak of the curve. A4 affects the low frequency side and A5 affects the high frequency side of curve.
3.	"	"	"	41.25MC 47.25MC	"	"	A7	Switch oscilloscope to 10X gain that was used in step 2. Adjust A7 for MINIMUM 47.25MC amplitude. 41.25MC marker should fall at approximately 50% on curve as in Fig. 3. If not make slight compromise of A4. Recheck step 2.
4.	"	"	"	40.50MC 41.30MC	"	"	A8	Disconnect bias battery and connect point (D) to chassis. Adjust A8 for maximum displacement of 40.50MC marker but not to exceed the displacement of 41.25MC marker. (See Fig. 4.).

SOUND IF ALIGNMENT

Connect an attenuator Zenith part #6-47303 or equivalent in series with the receiver antenna. Tune in a modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 3SM6 as evidenced by a bias similar to super-regeneration. Adjust A9 A10 A11 and A12 for maximum sound of best quality. Adjust the buzz control R6 for MINIMUM intercarrier buzz. If during sound IF alignment the signals rises above the limiting level of the 3SM6 (bias disappears) increase attenuation until the bias returns.

VHF RF AND MIXER ALIGNMENT FOR TUNERS #6-24652 AND #6-24663

Connect the negative lead of a 3 volt bias battery to the junction of C33 and R33. Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Fig. 5	Across antenna terminals thru matching network (Fig. 5)	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp thru 10K to point (X) Low side to chassis.	A15	Adjust by expanding or compressing coil turns to obtain response curve of maximum amplitude similar to Fig. 6 with markers symmetrically placed on curve.
6.	"	"	207MC (10MC Swp)	209.25MC 209.75MC	12	"	A14	"
7.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A13	"
8.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A12	"
9.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A11	"
10.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A10	"
11.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A9	"
12.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A20, A21, A22	"
13.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A23, A24	"
14.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A25, A26	"
15.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A27, A28	"
16.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A29, A30	"

VHF OSCILLATOR ALIGNMENT FOR TUNERS #6-24652 AND #6-24663

Connect bias as under "Video IF Alignment". Turn the fine tuning control so that the index hole in the fine tuning cam is directly over the small hole just below the channel 13 oscillator adjustment screw.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Fig. 5	Across antenna terminals thru matching network (Fig 5)	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (X) Low side to chassis.	A31	Adjust to place sound marker in trap notch as in Fig. 7. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A33	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A33	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A34	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A35	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A36	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A37	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A38	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A39	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A40	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A41	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A42	

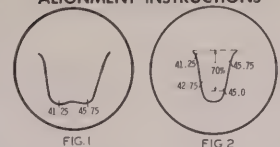


FIG. 1

FIG. 2

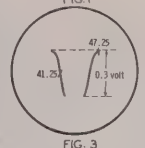


FIG. 3

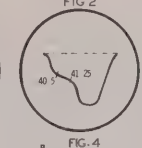
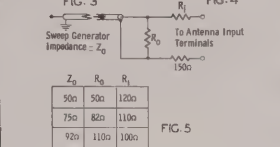


FIG. 4



Z_0	R_0	R_1
50Ω	50Ω	120Ω
75Ω	82Ω	110Ω
92Ω	110Ω	100Ω

FIG. 5

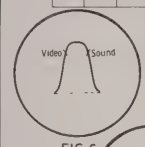


FIG. 6

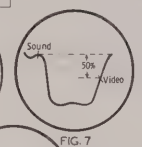


FIG. 7

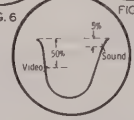


FIG. 8

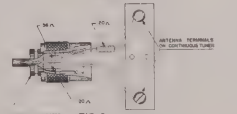
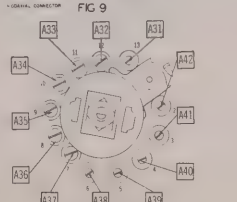


FIG. 9



OSCILLATOR ADJUSTMENTS

VHF OSCILLATOR ALIGNMENT FOR TUNER #6-24773

Leave bias connect as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp thru 47K to point (X) Low side to chassis.	A43	Adjust to place sound marker in trap notch as in Fig. 7. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A44	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A45	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A46	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A47	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A48	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A49	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A50	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A51	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A52	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A53	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A54	

VHF RF AND MIXER ALIGNMENT FOR TUNER #6-24773

Connect the negative lead of a bias supply (set at 2.5 volts) to the junction of C33 and R32. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Fig. 5	Across antenna terminals thru matching network. (Fig. 5).	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp thru 10K to point (X) Low side to chassis.	A55, A56, A57	Adjust A55 and A56 for maximum amplitude and symmetry with markers placed as indicated in Fig. 8. Increase the bias for MINIMUM amplitude of response curve. Without changing the bias, adjust A57, also to obtain MINIMUM response on the scope.
20.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (X) Low side to chassis.	A58	Adjust for maximum amplitude of response curve. Adjustments made by expanding or compressing coil turns.
			207MC (10MC Swp)	205.25MC 209.75MC	13		A59	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A60	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A61	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A62	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A63	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A64	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A65	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A66	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A67	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A68	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A69	

UHF ALIGNMENT

Alignment of the UHF tuner should not be attempted unless proper test equipment is available. Switch the receiver to the UHF position. Connect the negative lead of a 2 volt bias supply to point (D). Connect the positive lead to chassis. Adjust the sweep generator output to provide 3 volts peak to peak on the scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

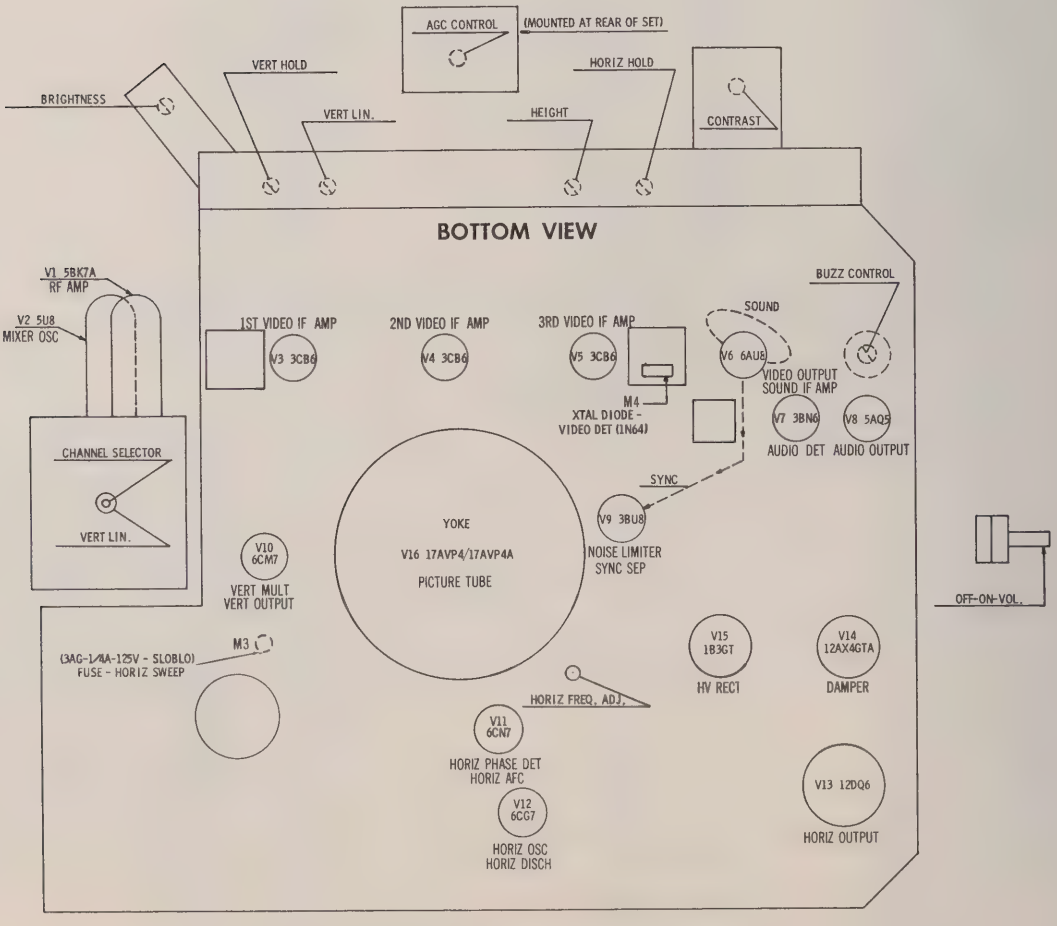
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
21.	Fig. 9	Across antenna terminals thru matching network (Fig. 9).	713MC (10MC Swp)	711.25MC	54	Vert. Amp. thru 10K to point (X) Low side to chassis.	A70, A71, A73	Tuner rocker arm should be in the horizontal position. If necessary, loosen the set screw and adjust the tuner so that rocker arm is horizontal when the channel selector is set to channel 54. Do not adjust A70 unless oscillator calibration is off more than 3 channels. If necessary, adjust A70 to place video marker at 50% on response curve as in Fig. 7. The image (weaker response) will appear also. The response toward the center clockwise position of A70 is the proper response. Adjust A71 and A73 for maximum amplitude of the response similar to Fig. 7.
22.	"	"	473MC (10MC Swp)	471.25MC	14	"		Check for response curve similar to Fig. 7. If the oscillator is off more than 3 channels, adjust the oscillator travel (osc., mixer and antenna travel adjustments are the 3 round thumb screws on top of tuner) adjustment to scale. Care must be used in making this adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
23.	"	"	887MC (10MC Swp)	885.25MC	83	"	A73, A74, A75	Adjust A73 to place marker at 50% as in Fig. 7. Adjust A74 and A75 for maximum amplitude and symmetry of response similar to Fig. 7.

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16220, 16221)

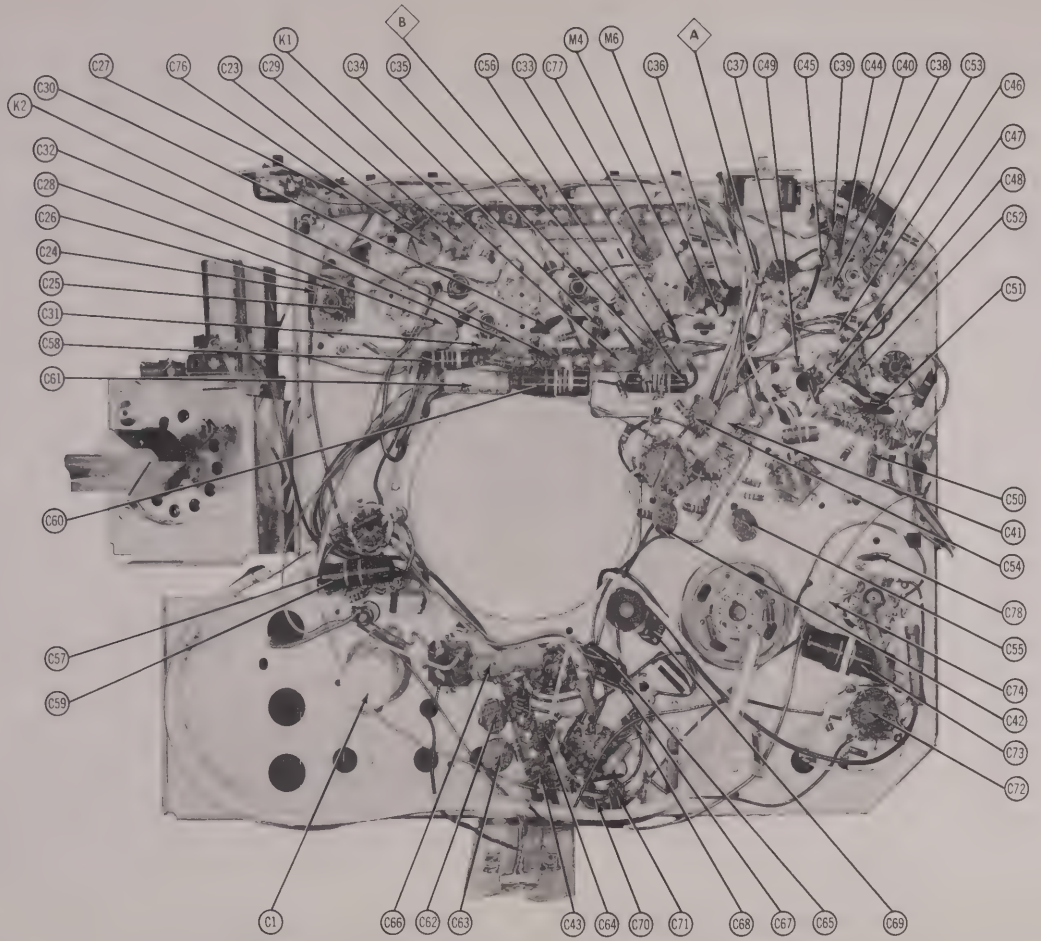
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5BK7A	†1300Ω	55K	INF	3Ω	1Ω	INF	2Meg	0Ω	0Ω
V2	5U8	†9500Ω	100K	†100K	0Ω	1Ω	†1000Ω	0Ω	0Ω	10K
V3	3CB6	1.5Meg	56Ω	5Ω	4Ω	▪1000Ω	▪1000Ω	0Ω		
V4	3CB6	▪3300Ω	70K	5Ω	6Ω	†1000Ω	†1000Ω	▪ 4.7Ω		
V5	3CB6	.1Ω	120Ω	7Ω	6Ω	†5000Ω	†5000Ω	0Ω		
V6	6AU8	0Ω	100K	†50K	8Ω	7Ω	47Ω	4600Ω	†7800Ω	†8000Ω
V7	3BN6	400Ω	.3Ω	10Ω	9Ω	†23K	5Ω	†440K		
V8	5AQ5	120K	680Ω	9Ω	8Ω	†1000Ω	†470Ω	120K		
V9	3BU8	0Ω	†11K	†47K	11Ω	10Ω	3.3Meg	2.5Meg	†1.7Meg	220K
V10	6CM7	▲11K	TP	0Ω	12Ω	11Ω	†5.1Meg	520K	2.2Meg	1500Ω
V11	6CN7	2200Ω	900K	500K	3Ω	3Ω	500Ω	6Meg	†47K	2Ω
V12	6CG7	▲200K	60K	0Ω	14Ω	13Ω	†65Ω	30K	10K	NC
V13	12DQ6	TP	17Ω	TP	†10K	550K	TP	19Ω	0Ω	TOP CAP 15Ω
V14	12AX4GTA	TP	NC	100K	NC	†70Ω	NC	17Ω	14Ω	
V15	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ▲270Ω
V16	17AVP4	3Ω	25K	PIN 6 †65Ω	PIN 10 †65Ω	PIN 11 †150K	PIN 12 4Ω			

† MEASURED FROM OUTPUT OF M2.
▪ MEASURED FROM PIN 2 OF V4.
▲ MEASURED FROM PIN 3 OF V14.
NC NO CONNECTION
TP TIE POINT

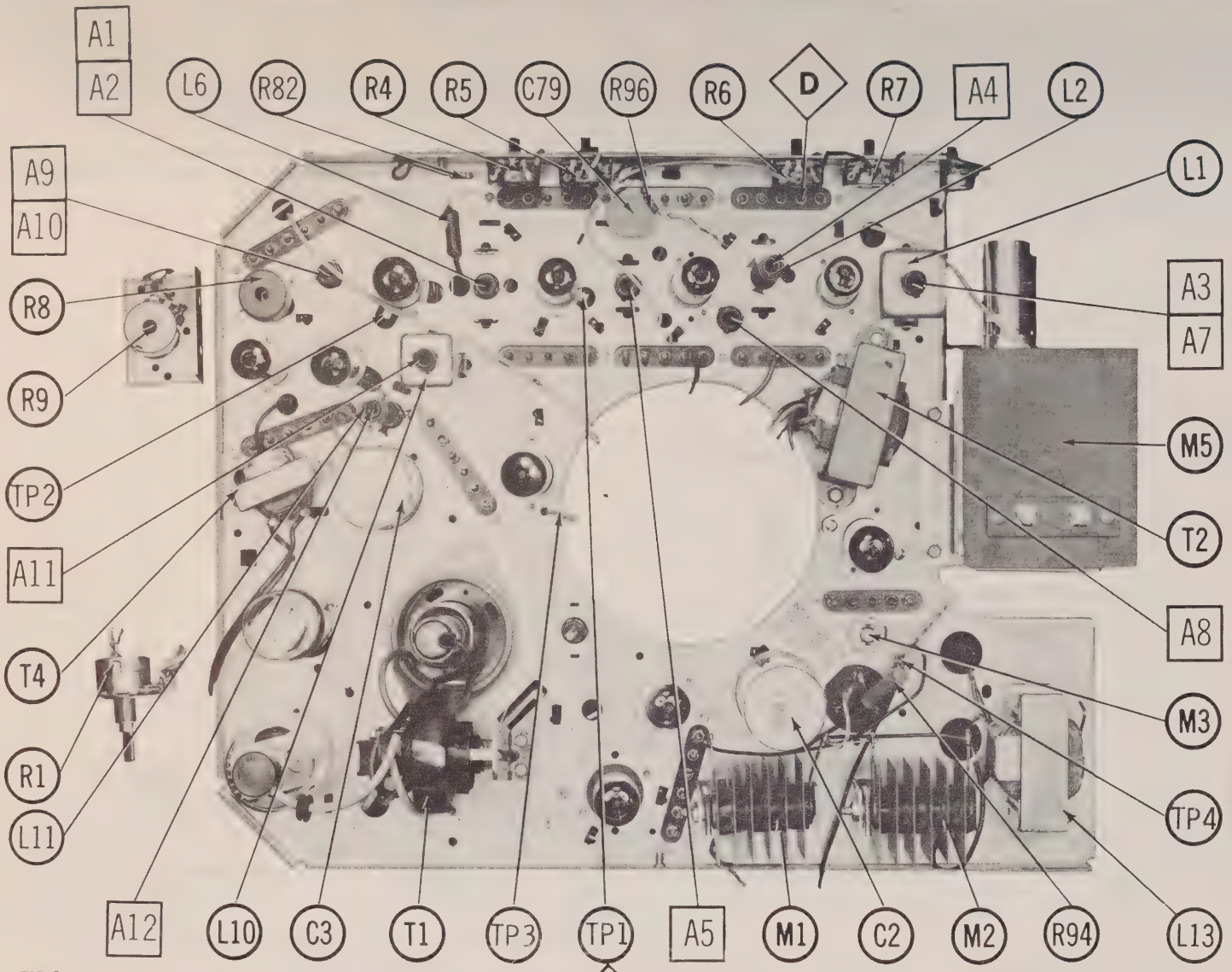


TUBE PLACEMENT CHART



PROPERTY OF
L. F. BLANKENSHIP
3924 W[illegible]
DENVER, [illegible]

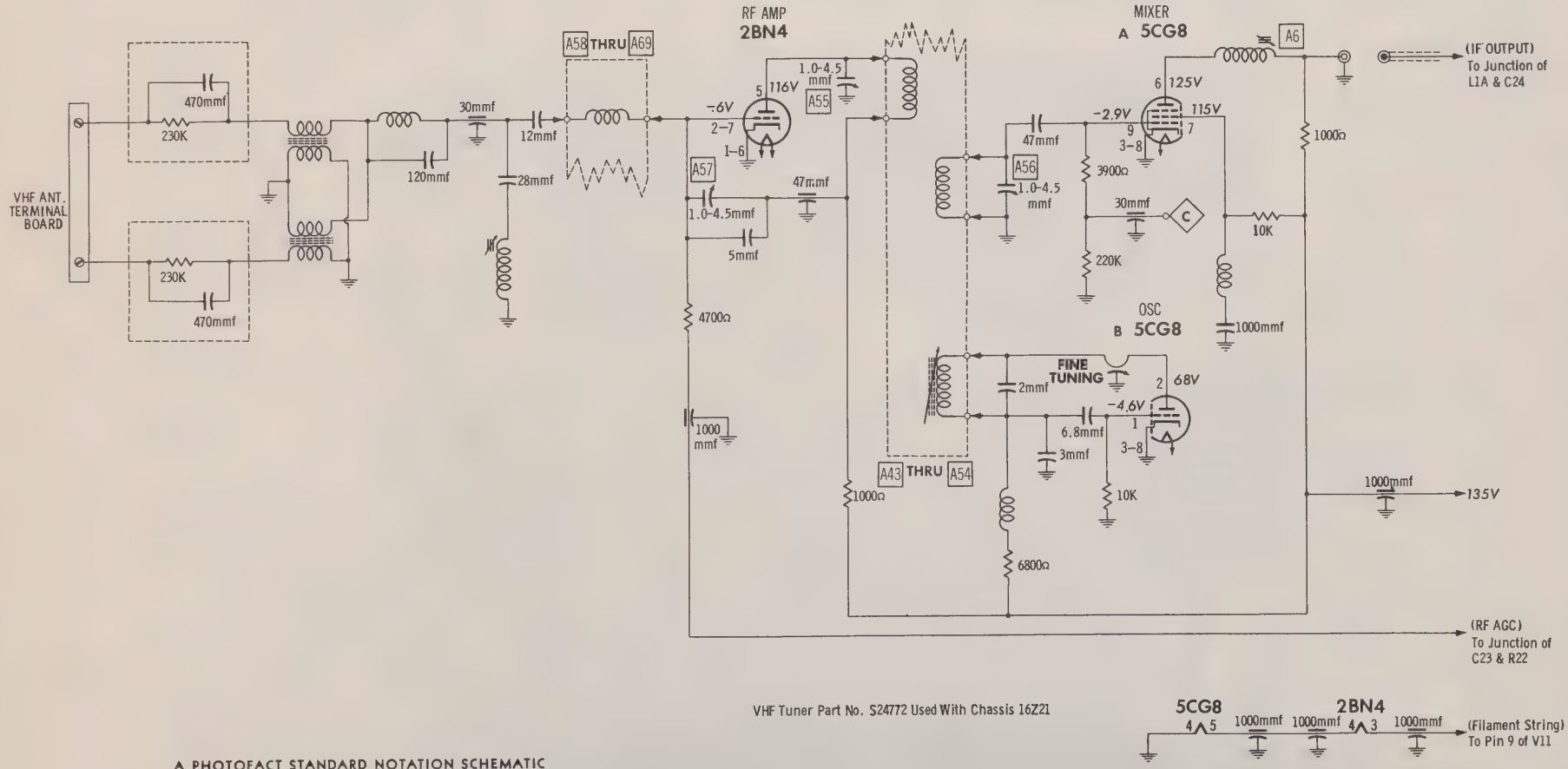
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS TOP VIEW

PROPERTY OF
F. BLANKENSHIP
3924 INCA ST.
DENVER, COLORADO

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU,
Z1818C, CU, E, EU, R, RU (Ch. 16220, 16221)



VHF Tuner Part No. S24772 Used With Chassis 16Z21

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER SCHEMATIC

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (Ch. 16Z20, 16Z21)

ALTERNATE VHF-UHF TUNER SCHEMATIC

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	3BA7A	
V2	Mixer-Oscillator	5U8	
V3	1st Video IF Amplifier	3CB6	
V4	2nd Video IF Amplifier	3CB6	
V5	3rd Video IF Amplifier	3CB6	
V6	Video Output	6BQ6	
V7	Sound IF Amplifier	6AU6	
V8	Audio Detector	3BN6	
V9	Audio Output	5AQ5	
V10	Noise Limiter-Sync Sep	3BU8	
V11	Vert. Mult.-Vert. Output	6CM7	
V12	Horiz. Phase Det.-Horiz. AFC	6CM7	
V13	Horiz. Osc.-Horiz. Disch	6CQ7	
V14	Horiz. Output	12DQ6	
V15	Damper	12AX8GTA	
V16	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ZENITH PART No.	RCA PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	17AVP4	17AVP4A	17AVP4A	17AVP4A ①	① Aluminized ② Bluish Green "B5"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	150	12-2745	AFH81-33	XA0261	FPU7	TMD-24	T-050	TV-1-3426
C2A	40	300	12-2741	AFH3-99.83	CGS200	FP336.7		Q221-5	R3200
B	40	300			BR505			MT-4580	
C	80	50							
C3A	4	300	12-2874	AFH4-U3-60		FP474-5		Q-205	R3201
B	40	300						MT-4710	
C	30	35							
D	40	475							

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors

ITEM No.	RATING CAP	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	18		23-3679		TCS-18	TM18		TCC-18			
C5	18		23-3680								
C6	18		23-3680								
C7	18		23-3679		TCS-18	TM18	TCC-18				
C8	8.2		23-3681	HPG-DSP. 3		SM8	TCC-8				
C9	19		23-3438								
C10	1000		21-2732	EF-001	MFT-1000						
C11	1000		21-2677	EF-001	MFT-1000						
C12	25		22-2671	NPO-DT25	TCZ-25	ZO25	TCO-25	ZT-5425	5TCC-Q25		
C13	2		22-2720	NPO-SL1	TCZ-1	TZ01	TCO-1		5TCCB-V1		
C14	1		23-2716								
C15	1		23-2716								
C16	8		23-2716								
C17	1000		23-2732	EF-001	MFT-1000				5GSC-D1		
C18	1000		23-2732	EF-001	MFT-1000				5GSC-D1		
C19	1000		21-2732	EF-001	MFT-1000				5GSC-D1		
C20	600		23-3331	BPD-0008	CD-601	CD07	ED-600		5HK-D1		
C21	1000		23-2733	EF-001	MFT-1000				5GSC-D1		
C22	1000		23-2733	EF-001	MFT-1000				5GSC-D1		
C23	1000		23-3	BPD-81	CD-103	CD03	ED-01	DC-501	5HK-D1		
C24	10		23-3731								
C25	470		23-6	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C26	8		23-3684	MPD-DSP.3		Z015	TCO-8				
C27	25	200	22-2652	PYSEM-25		CUSEP25		GEM-3015	5TM-P25		
C28	470		22-16	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C29	1000		23-17	BPD-001	DD-102	K069	ED-001	DC-531	5HK-D1		
C30	470		23-16	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C31	18		23-3396								
C32	1000		23-17	BPD-001	DD-102	K069	ED-001	DC-531	5HK-D1		
C33	330		23-3666	BPD-00033	DD-331	C066	ED-330	UC-5333	5GA-P33		
C34	1000		23-17	BPD-001	DD-102	K069	ED-001	DC-531	5HK-D1		
C35	1000		23-17	BPD-001	DD-102	K069	ED-001	DC-531	5HK-D1		
C36	4.7		23-3667	HPG-S24.7	TCZ-4R7	TZ07	TCO-4.7	ZT-5547	5TCCB-V47		
C37	470		23-16	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C38	47		22-2467								
C39	10000		22-3	BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1		
C40	.1	300	23-3737	PSEM-1	DF-104	CUSEP1		GEM-201	5TM-P1		
C41	.1	200	23-2790	PSEM-1	DF-104	CUSEP1		GEM-301	5TM-P1		
C42	100		22-9	MPD-DS100	DM-101	CM13	ED-100	DC-581	9GA-T1		
C43	10000		22-3	BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1		
C44	5		22-2343	NPO-S15	TCS-5R3	Z007	TCO-5	ZT-553	5TCCB-V33		
C45	50		22-3400	NPO-S250	TCS-50	S084	TCO-50	ZT-565	5TCCB-Q5		
C46	2.6		23-3396								
C47	7.8		22-2743								
C48A	1000		22-21	BPD-2X001	DD8-102	DK069	ED8-102	DCD-521	5HK-2D1		
B	1000										
C48	10		23-2731								
C50	470		22-6	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C51	10000		22-3	BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1		
C52	3300		22-8	BPD-0033	DE-332	K073	ED-0033	UC-5322	5HK-D22		
C53	470		23-6	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47		
C54	3300		23-11	BPD-0033	DE-332	K077	ED-0033	UC-5333	5HK-D33		
C55	10000		23-3	BPD-01	DD-103	K082	ED-01	DC-511	5HK-S1		
C56	333	400	22-2632								
C57	.01	300	23-3565	1404-81		DB381			MS-31		
C58	.0047	600	22-1649	1464-0047		UR3D47			MS-247		
C59	.1	400	22-2661	P468K-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C60	.033	600	22-2351								
C61	.047	300	22-2721	BPD-08	DF-503	CUSB47		GEM-4047	5TM-S47		
C62A	51		22-23	NPO-D250	TCZ-51	Z025	TCO-51	ZT-545	5TCC-Q5		
B	51			NPO-D150	TCZ-51	Z025	TCO-51	ZT-545	5TCC-Q5		
C63	2200		22-18	1464-0022		UR3D22		MS-222	MS-222		
C64A	1000		22-21	BPD-2X001	DD8-102	DK069	ED8-001	DCD-521	5HK-2D1		
B	1000										
C65	.01	300	22-1809	BPD-01	DE-103	CUB4P1	GP-10000	GEM-411	4TM-S1		
C66	.1	300	23-2780	PSEM-1	DF-104	CUB2P1		GEM-301	3TM-P1		
C67	680	500	23-3668	1464-00068		UR3T68			MS-268		
C68	1500		23-12	1464-0015		UR3D15	ED-1500	MC3456	MS-215		
C69	1000	100	23-3383	1464-001		UR3D1	ED-1000	MC3255	MS-21		
C70	1000		23-17	1464-001	DD-103	UR3D1	ED-1000	MC3255	MS-21		
C71A	1000		22-21	1464-001		UR3D1	ED-1000	MC3255	MS-21		
B	1000			1464-001		UR3D1	ED-1000	MC3255	MS-21		
C72	4700		23-16	BPD-0047	DD-473	K079	ED-0047	UC-5347	5HK-D47		
C73	.15	400	22-61	P468K-15		CUB4P15		GEM-4015	4TM-P15		
C74	56	4000	23-3389								
C75	56	2000			DE30-560		ED3-56	DC-30456	30GA-Q56		

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C76	470		23-6	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47	
C77	470		23-6	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47	
C78A	4700		23-14	BPD-2X0047	DD-472	D3079	ED-0047	UC-5347	5HK-2D47	
B	4700				DD-472		ED-0047	UC-5347		
C79	1400		23-2655							

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	63-3615	B-58-S	A47-1Meg-S	QU-137	U54	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req	Not Req	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	78-1	US-26	Attach to R1A
R2	100Ω	½	63-3000			WPK-7500		Contrast control - wire wound
R3A	500K	½	63-3264	AB-61		QU7-133	PTA55R	Brightness Control
B	Shaft		Not Req.	AK-19		TQ	Not Req.	Attach to R3A
R4	500Ω	½	63-3634			QU-103	PTA55L	Horiz. Hold
R5A	7.5Meg With 1Meg Stop	½	63-3363	AB-58	A47-7.5Meg-S	QU-143	PTA55L	Height Control
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R5A
R6A	5300Ω	½	63-3380	AB-9	A47-4000-S	QU-134	PTA52L	Vert. Linearity
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R6A
R7A	750K	½	63-3382	AB-56	A47-750K-S	QU-136	PTA75L	Vert. Hold
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R7A
R8	750Ω With 100Ω Stop	1	63-3384		39-800-S0			Dust Control
R9A	350K	½	63-3835	AB-59	A47-500K-S	BU-133	TA55L	AGC Control
B	Shaft		Not Req.	AK-1	FKS-1/4	TMS-KIT	Not Req.	Attach to R9A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R10	250K				
R11	330K				
R13	33K		63-1841	BTB-33K	
R13	180K		63-1872	BTB-180K	
R14	10K		63-1869	BTB-10K	
R15	1200Ω			BTB-1200	
R16	100K		63-1869	BTB-100K	
R17	100K		63-1869	BTB-100K	
R18	270Ω			BTB-270	
R19	10K	2	63-3170	BTB-10K	
R20	10K			BTB-10K	
R21	4700Ω		63-1828	BTB-4700	
R22	470K		63-1897	BTB-470K	
R33	3Meg		63-1821	BTB-3Meg	
R34	130K		63-1873	BTB-130K	Note 1
R25	3000Ω		63-1788		
R26	39Ω		63-1852		
R27	47K		63-1865		
R28	1000Ω		63-1786	BTB-1000	
R29	56Ω		63-1733	BTB-56	
R30	12MΩ		63-1875		
R31	130K		63-1873		
R32	3300Ω				
R33	1000Ω		63-1786	BTB-1000	
R34	470Ω		63-1771	BTB-470	
R35	120Ω		63-1747	BTB-120	
R36	47K		63-1855	BTB-47K	
R37	4700Ω		63-1813	BTB-4700	
R38	3300Ω		63-1799	BTB-3300	
R39	4700Ω		63-1813	BTB-4700	
R40	470Ω	4	63-3675		Note 2
R41	47000Ω	4	63-3675		Note 2
R42	2.2Meg		63-1815	BTB-1.2Meg	
R43	39K		63-1852	BTB-39K	
R44	100K		63-1869	BTB-100K	
R45	1800Ω		63-1796	BTB-1800	
R46	47Ω		63-1729	BTB-47	
R47	100K		63-1869	BTB-100K	
R48	680Ω		63-1779	BTB-6800Ω	
R49	33K		63-1841	BTB-33K	
R50	33K	3	63-1866	BTB-33K	
R51	390K		63-1894	BTB-390K	
R52	470Ω		63-1771	BTB-470	
R53	680Ω	1	63-3290	BTA-680	Note 4

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R54	680K		63-1904	BTB-680K	
R55	180K		63-1880	BTB-180K	
R56	180K		63-1880	BTB-180K	
R57	2.2Meg		63-1825	BTB-2.2Meg	
R58	68K		63-1883	BTB-68K	
R59	470K		63-1897	BTB-470K	
R60	82K		63-1886	BTB-82K	
R61	100K	1	63-1869	BTB-100K	
R62	3.3Meg		63-1833	BTB-3.3Meg	
R63	2.7Meg		63-1826	BTB-2.7Meg	
R64	3.3Meg		63-1833	BTB-3.3Meg	
R65	390K		63-1894	BTB-390K	
R66	33K		63-1841	BTB-33K	
R67	330K		63-1895	BTB-330K	
R68	82K		63-1886	BTB-82K	
R69	100K		63-1869	BTB-100K	
R70	2.2Meg		63-1825	BTB-2.2Meg	
R71	220Ω		63-1758	BTB-220	
R72	1000Ω	1	63-1868	BTA-1000	
R73	33K		63-1841	BTB-33K	
R74	390Ω				
R75	390Ω				
R76	470K		63-1897		
R77	2300Ω		63-1799		
R78	470K		63-1897		
R79	10Meg		63-1953		
R80	10Meg		63-1053		
R81	47Ω	1	63-4194		
R82	330Ω		63-1764		
R83	10K	2	63-2145		
R84	33K		63-1841		
R85	68K		63-1883		
R86	180K		63-2313		
R87	33K		63-1841		
R88	470K		63-1897		
R89	100Ω		63-1744	BTB-100	
R90	100Ω		63-1744	BTB-100	
R91	10K	4	63-3633	1 3/4A-10K	
R92	10K	4	63-3686	1 3/4A-10K	
R93	33K		63-1841	BTB-33K	
R94	6Ω	5	63-3044		
R95	56Ω	30	63-3689	2D-50	Note 3
R96	220K			BTB-220K	Note 4
R97	2.8Ω			BW-3.3	

Note 1. A 100K used in some versions.
Note 2. Used in Ch. 1852i only.
Note 3. 2i brackets for mounting resistor is not included with resistor.
Note 4. Resistance of WW rectifier filament leads (#30 advance resistance wire). May be replaced with standard HV filament wire and a 3.3Ω resistor.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	ZENITH PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Horiz. Output Trans.	S-33993 ① E-60243 ②③				X137 * X137 *			
T2	Vert. Output Trans.	95-1473	Z1900 ④⑤	A-3059 ①		V31③ ⑤	A-8161 ①	26854 ⑤	A-102X ④ ⑤
T3A	Yoke (90°) Horiz (110°)	95-1452 ⑥	DF600 ⑦⑧	MDF-91 ⑤	137DH ⑦⑧	Y90F12 ⑦	DY-13A ⑤	Y-14 ⑦⑧	Y-40-1 ⑤
B	Vert. (410Ω)							⑦⑧	

① Complete assembly. Includes: Winding and terminal assembly, Zenith Part #S-23491. Tertiary winding and terminal assembly, Zenith Part #S-34623.
② Alternate Zenith part number.
③ Use 15 to 1 turns ratio.
④ Connect as auto transformer.
⑤ Drill new mounting hole(s).
⑥ Includes capacitor C75, resistors R74 and R75.
⑦ Connect horizontal yoke damping network across terminals #3 and #7
⑧ Use original yoke damping network if necessary.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connects to	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4				4			
3				3			
2				2			
1				1			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	ZENITH PART No.	Halldorson PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	20 TR	3-4Ω	95-1438	ZUM7 ①	A-3932 ①	24852 ①	S-11X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C	RATINGS IMP	ZENITH PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω		42-750	4A07	33361	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	1st. Video IF	1Ω		S-24775				
B	47.25MC Trap	0Ω						
C	RF Choke	0Ω						
L2	2nd. Video IF	.1Ω	7.3Ω	S-23992				
L3	Cathode Trap	8.3Ω		S-24080				Tapped @.8Ω
L4	3rd. Video IF	.1Ω	.1Ω	S-23993			6319	
L5	4th. Video IF	.5Ω	.5Ω	S-23960				
L6	Shunt Peaking Coil	9.3Ω		S-16015	19-1300	TV-190	6132	325 Microhenries
L7	Series Peaking Coil	3.8Ω		S-32444	19-8022		4626	25 Microhenries
L8A	4 5MC Trap	12Ω		S-32250				
B	Sat. Sound IF	1.5Ω						
L9	Series Peaking Coil	8Ω		S-20860	19-8135 *		6138*	127 Microhenries, wound on 1BK resistor
L10	Ind. Sound IF	2Ω	5Ω	S-32248				
L11	Quadrature Coil	4.5Ω		S-19020			1460	

* Parallel with 1BK resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI	DC RES SEC	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L12	162Ω		S-19743	19-1577		6334				Tapped @.65Ω

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L13	240A	67Ω	7 H	95-1376	C1037 ①	C-2896 ①	C-2336 ①	26C44	C-23X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	No replacement
K2	Multivibrator Coupling		87-4	No replacement

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	ZENITH PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.240A	213-14	1238AB	MR300	50300	6Q4	300	
M2	.240A	213-14	1238AB	MR300	50300	6Q4	300	

FUSES

ITEM No.	TYPE	RATING	ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	N	1.4A 125V	126-33		333.250 (¼ 1/4A)	346008	N 1/4	HN 6-5/10

ZENITH MODELS Z1814R, RU, Y, YU, Z1816C, CU, E, EU, R, RU, Z1818C, CU, E, EU, R, RU (CH. 16220, 16221)

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

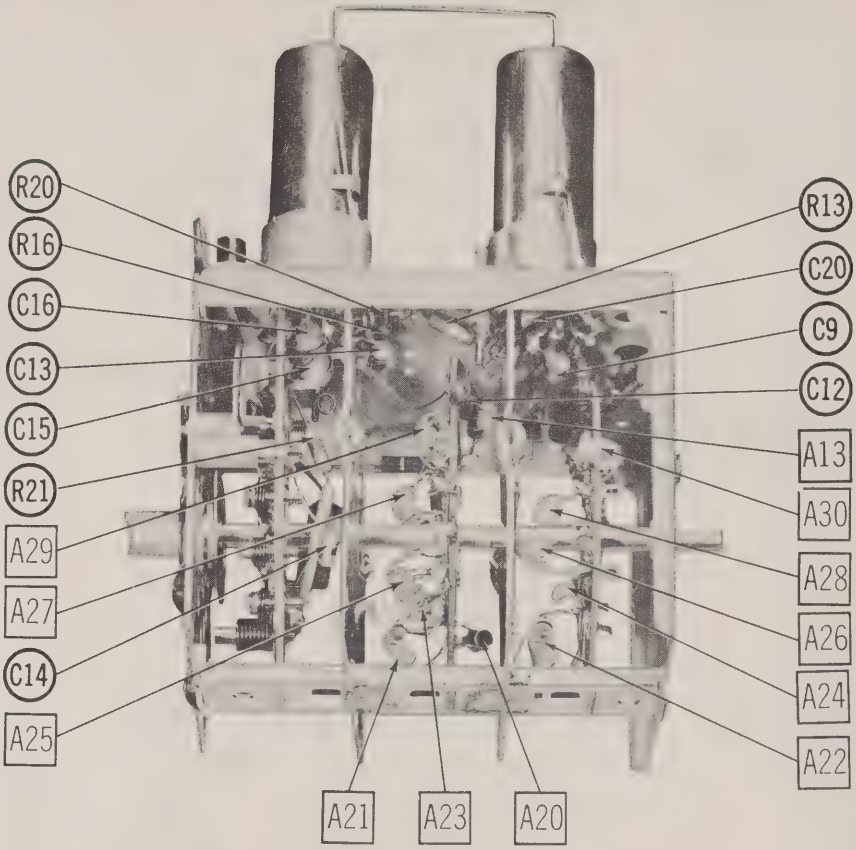
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ZENITH PART No.	SYLVANIA PART No.	
M4	1N64	103-18	1N64	Video Detector (Pigtail)

MISCELLANEOUS

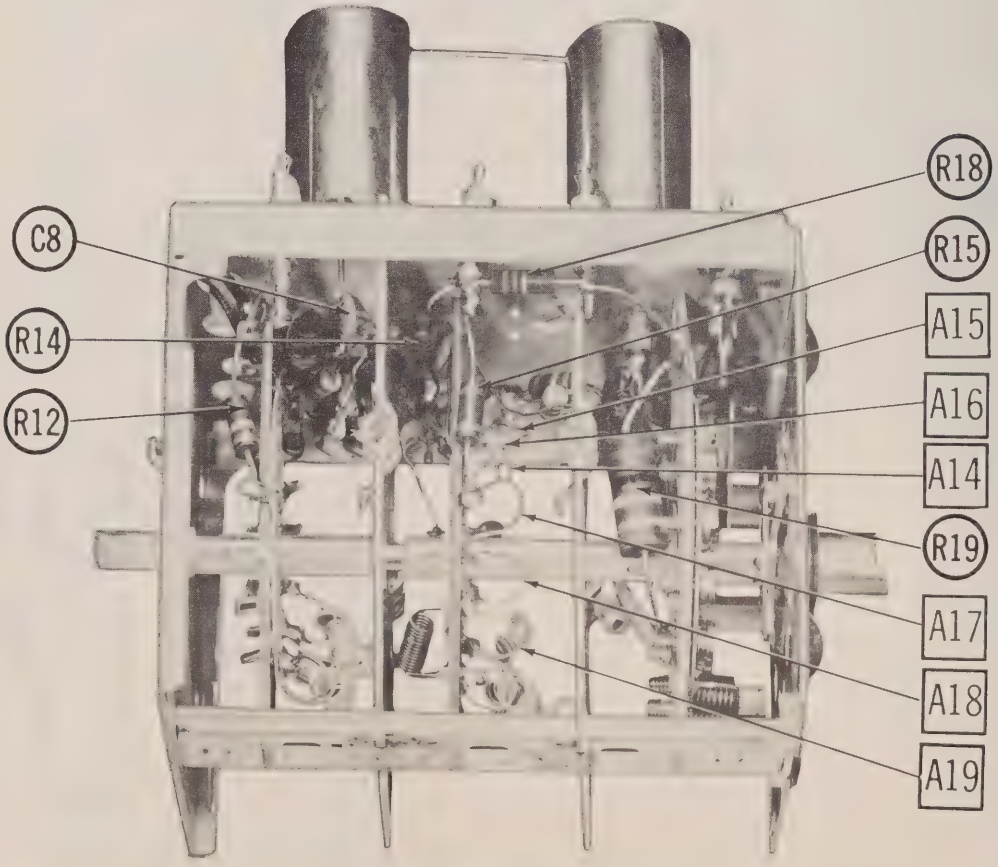
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M5	Tuner	S-24662	VHF - Models Z1814Y, Z1814R
	Tuner	S-24663	VHF - Models Z1814YU, Z1814RU
	Tuner	S-24772	VHF - Models Z1816R, E, C, Z1818R, E, C
	Tuner	S-24773	UHF - Models Z1816RU, EU, CU, Z1818RU, EU, CU
	Tuner	S-22530	UHF - Models Z1814YU, RU, Z1816RU, EU, CU, Z1818RU, EU, CU
M6	Trap Assy.	S-22518	Part of S-24662
M7	Width Adjustment		Brass Sleeve
M8	Centering Device	S-22560	
M9	Ion Trap	S-17164	Models Z1814Y, YU
	Ion Trap	S-22574	Alternate part for Models Z1814Y, YU. Used in Models Z1814R, RU, Z1816R, RU, E, EU, C, CU, Z1818R, RU, E, EU, C, CU
	Cabinet	14-1812	Models Z1814Y, YU
	Cabinet	14-1808	Models Z1814R, RU, Z1816R, RU
	Cabinet	14-1976	Models Z1816E, EU
	Cabinet	14-1975	Models Z1816C, CU
	Cabinet	14-2087	Models Z1818R, RU
	Cabinet	14-2089	Models Z1818E, EU
	Cabinet	14-2088	Models Z1818C, CU
	Knob	46-1539	On-off-volume - Models Z1814Y, YU, R, RU
	Knob	46-1540	On-off-volume - Models Z1816R, RU, Z1818R, RU
	Knob	46-1541	On-off-volume - Models Z1816C, CU, Z1818C, CU
	Knob	46-1585	On-off-volume - Models Z1816E, EU, Z1818E, EU
	Knob	46-1542	Channel selector - Models Z1814Y, YU, Z1814R, RU
	Knob	46-1543	Channel selector - Models Z1816R, RU, Z1818R, RU
	Knob	46-1587	Channel selector - Models Z1816E, EU, Z1818E, EU
	Knob	46-1544	Channel selector - Models Z1816C, CU, Z1818C, CU
	Knob	S-22863	Fine tuning - Models Z1814Y, YU, R, RU
	Knob	S-22863	UHF tuning - All models ending in "U"
	Knob	S-24837	Fine tuning - Models Z1816R, RU, E, EU, C, CU
	Knob	S-46-1581	Fine tuning - Models Z1818R, RU, E, EU, C, CU
	Knob	S-24842	Horiz. hold - vert. hold - Models Z1814Y, YU, R, RU, Z1816R, RU, E, EU, Z1818R, RU, E, EU
	Knob	S-24848	Horiz. - Vert. hold - Models Z1816C, CU, Z1818C, CU
	Knob	S-24841	Brightness - contrast - Models Z1814Y, YU, R, RU, Z1816R, RU, E, EU, Z1818R, RU, E, EU
	Knob	S-24847	Brightness - contrast - Models Z1816C, CU, Z1818C, CU
	Knob	S-22025	UHF Dial - All models ending in "U"
	Glass	192-195	Models Z1814Y, YU, R, RU
	Glass	192-196	Models Z1816R, RU, E, EU, C, CU
	Glass	192-228	Models Z1818R, RU, E, EU, C, EU

ALTERNATE VHF-UHF TUNER SCHEMATIC

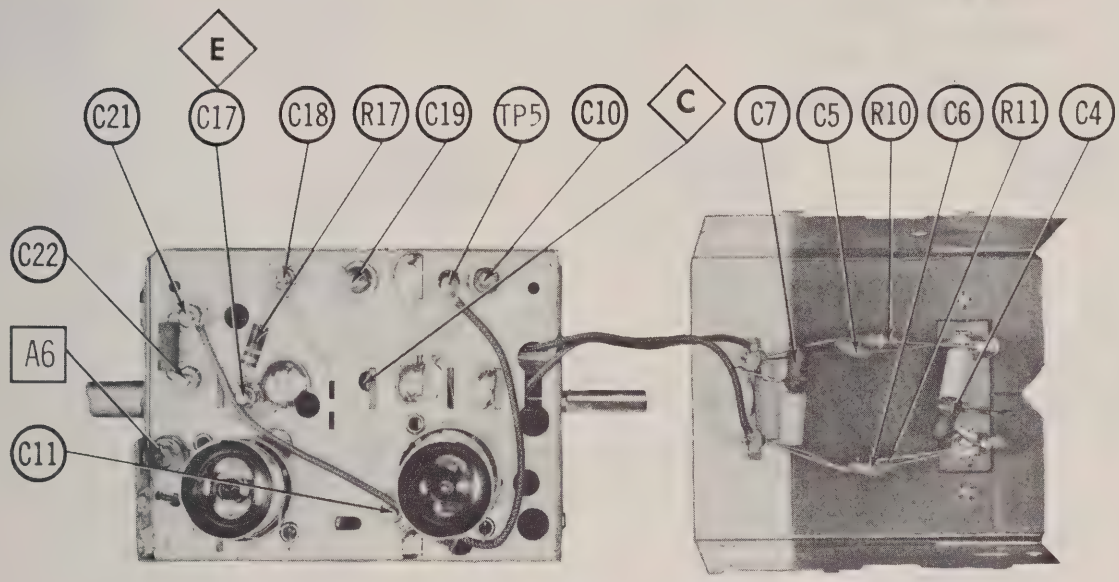
MIXER A 5U8
RF AMP 5BK7A
OSC B 5U8
5BK7A
UHF OSC 2AF4A
(IF OUTPUT) To Junction Of L1A & C24
(RF AGC) To Junction Of C23 & R22
(Filament String) To Pin 9 of V11
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part No. S24663
UHF-VHF Tuner Used With Chassis 16Z20
These Cores Serve As RF Chokes To Reduce Oscillator Radiation & Must Not Be Removed
UHF-VHF ANT TERMINALS
Distributed Capacity
Crystal Mixer
CRYSTH
Channel Bracket
UHF Tuner Part No. S22530
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1957



RF TUNER-RIGHT SIDE

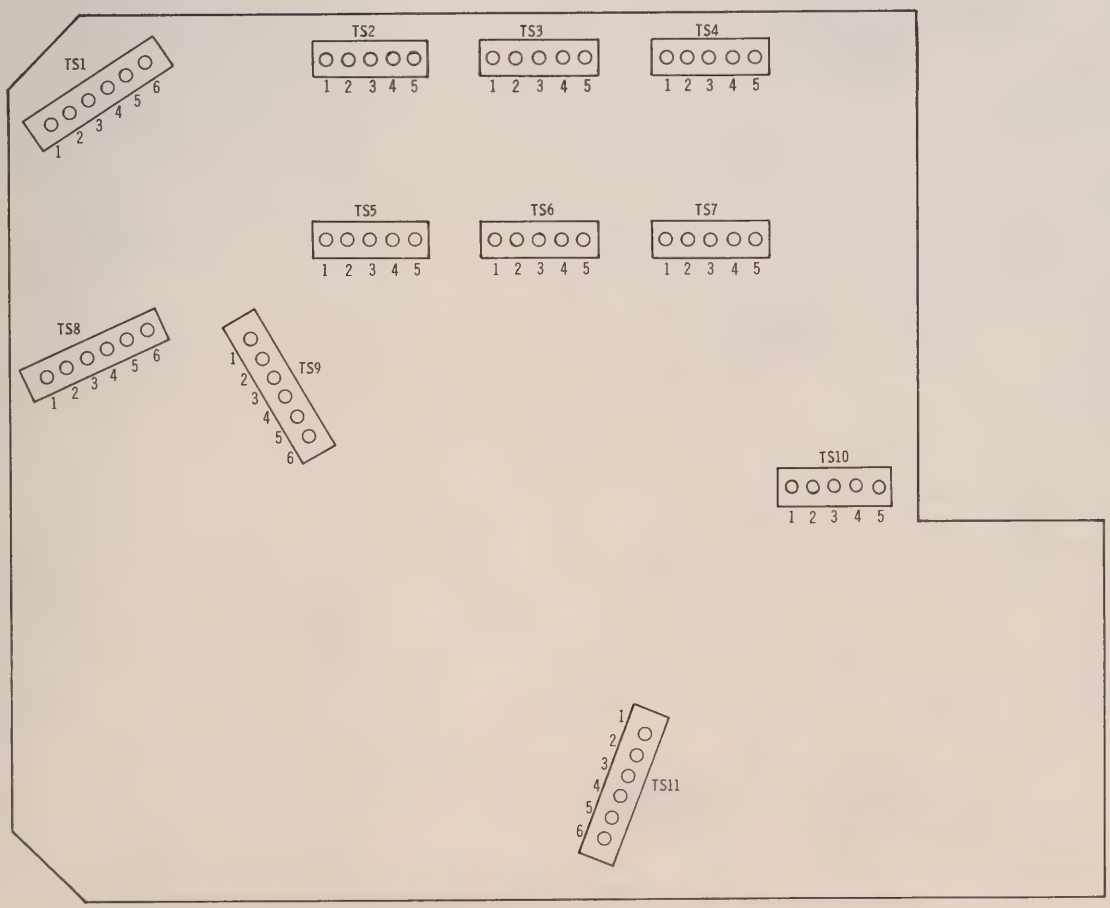


RF TUNER-LEFT SIDE

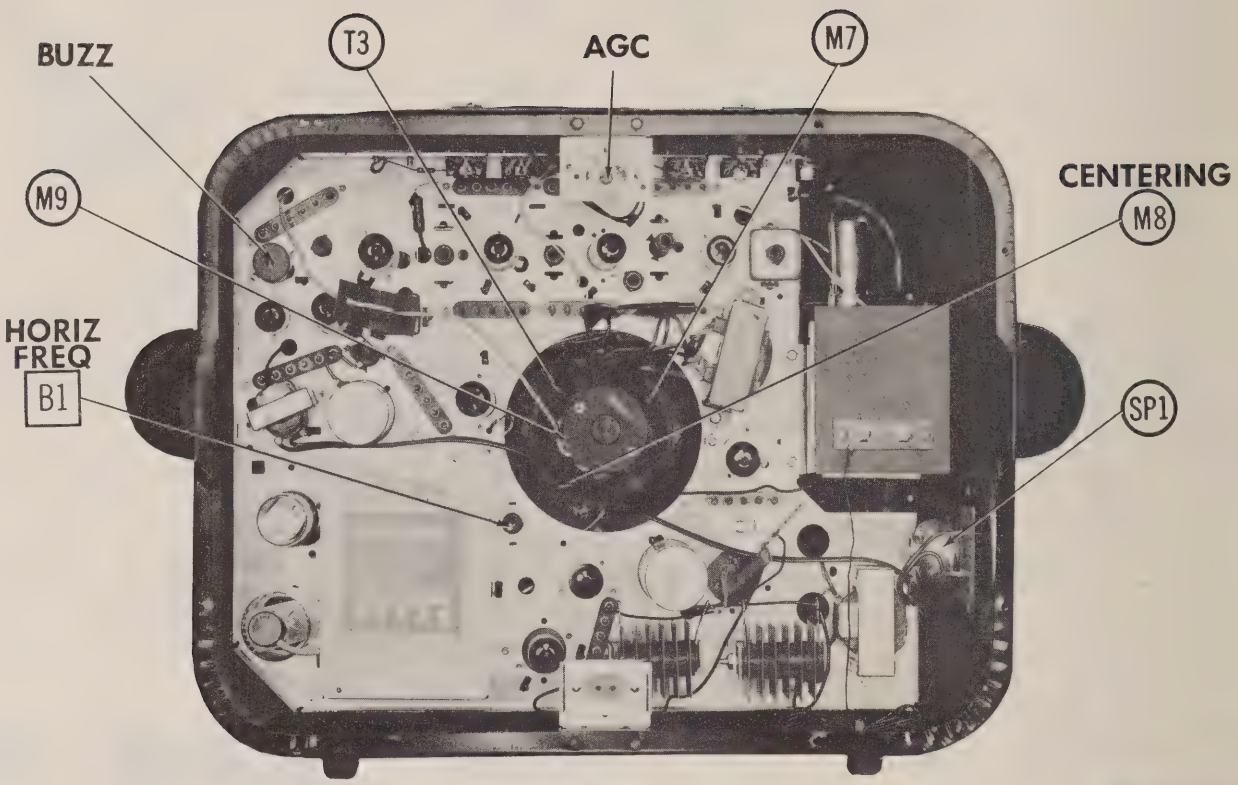


TP5 - 8VAC TUNER (FILAMENT)

RF TUNER TOP VIEW



TERMINAL LOCATION CHART



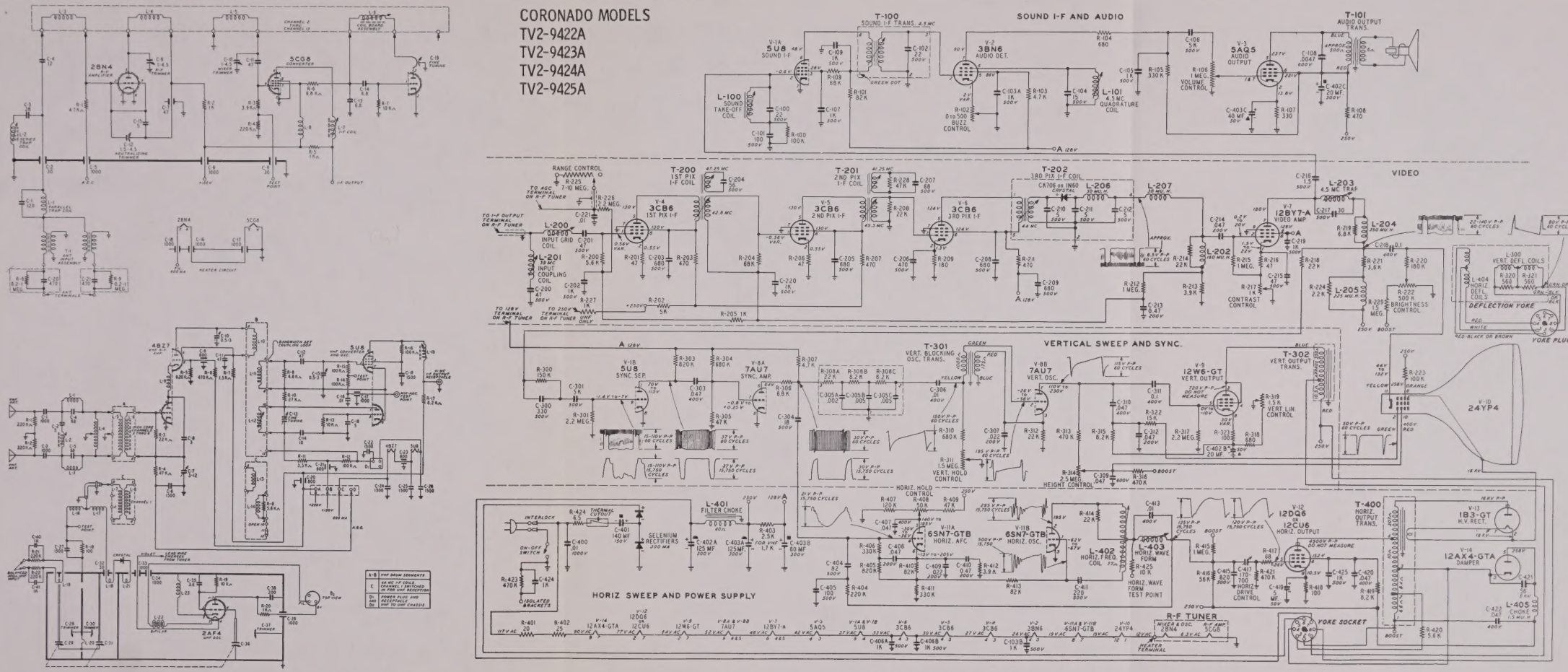
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control to the center of its range and adjust the horizontal frequency coil (B1) until the picture synchronizes horizontally.

Adjust the brass width sleeve located on the neck of the picture tube for a picture lightly wider than necessary to fill the picture mask horizontally.

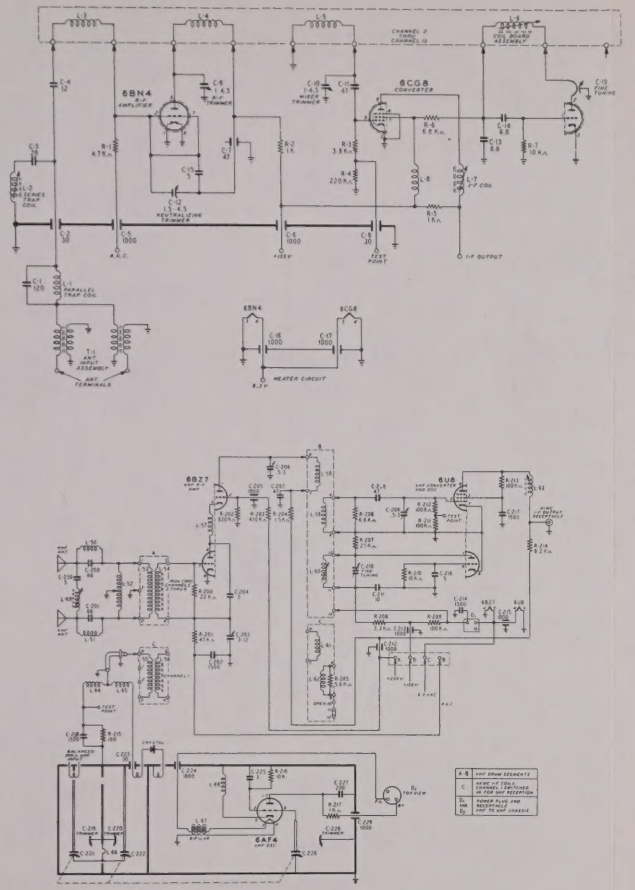
CORONADO MODELS
TV2-9422A
TV2-9423A
TV2-9424A
TV2-9425A



SCHEMATIC COURTESY OF GAMBLE-SKOGMO INC.

CORONADO

CORONADO MODELS
TV2-9426A
TV2-9427A
TV2-9428A
TV2-9429A
TV2-9430A
TV2-9431A
TV2-9432A
TV2-9433A



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